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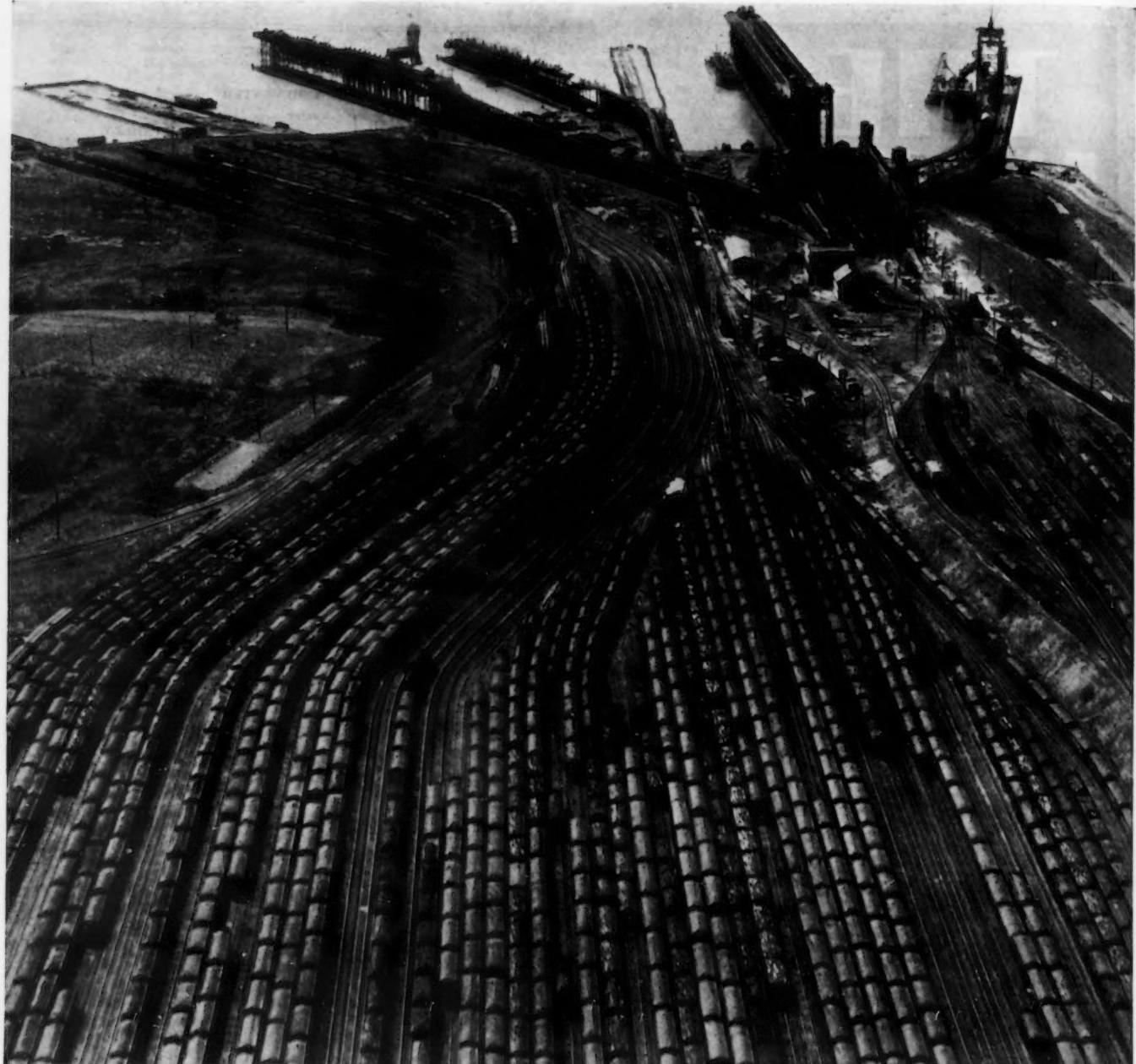
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... THE IRON AGE ...

FEBRUARY 11, 1937

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A Forthcoming Two-Horned Dilemma

MAKERS and sellers of capital equipment, such as machine tools, are experiencing a period of brisk demand. Plants are working, some of them night and day, on schedules as far ahead as six months. Competition is keener for skilled mechanics to turn out orders on hand than it is for new business. Red ink has turned to black and, barring unexpected upsets, 1937 looks pretty good as far as one can peer ahead into it.

Some able men in the industry, however, are taking this upswing with what might be called reservations. These men do not spend all of their time looking ahead through the front door. From time to time, they peek out of the back window. In so doing, they have caught a glimpse of a rather ominous two-horned creature pawing the ground and waiting for an opportune moment to charge down upon machinery builders and their customers from the rear.

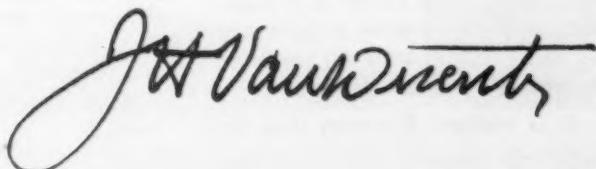
This fearful animal is what is known as a two-horned dilemma to those who have studied economic zoology. To the general public, which does not see the horns, it is called the Corporate Surplus Tax Act.

All business is "cyclical" in the sense that it has its up and downswings over a term of years, but the capital goods business is extremely so. There may be perhaps four good or profitable years in a ten year period. The good business that machine tool builders are enjoying now, for example, is not this year's business; it is the accumulated demand of four or more years of non-buying. And after the demands of accumulated obsolescence have been satisfied, the rush may be over, especially if we hit, as we undoubtedly will and always have, another downswing.

What are the builders of capital equipment going to use for money during the six lean years out of ten, if the threatening dilemma punches holes in their coffers and causes the surpluses to leak out and disappear?

The dilemma has a horn ready for the buyer as well as for the seller. Because of the Corporate Surplus Tax Act, many companies financing replacement of equipment out of earnings are now taxed heavily for that purpose. It may run as high as 40 per cent. Right now the need for new machines is greater than the need for money, but what is going to happen after that need for equipment has been reasonably filled?

"Bigger and better" depressions will be in order for the makers of capital equipment unless the Corporate Surplus Tax Act is revised.



WHEN WILL THE RAILROADS BUY MACHINE TOOLS ?

By H. LEE STERRY

The Bullard Co., Bridgeport, Conn.

THE railroads will buy machine tools when they are financially able, when the investment appears warranted from the point of view of current needs, and when the machine tool industry convinces them that replacement of their equipment would be profitable.

There is little doubt that the railroads as a group could at any time afford to spend considerable money for machine tools. It would not be extremely burdensome in a normal year for them to replace all tools over 10 years old with a sufficient number of new ones so that shop capacity would be ample.

The investment in strictly machine tools at the present time does not greatly exceed \$200,000,000, and according to the best estimates about \$25,000,000 to \$30,000,000 has been spent in the last 10 years by Class I railroads for new tools. This leaves a replacement expense of some \$175,000,000 to bring the tools in all shops to an age of less than 10 years.

It is realized, however, that the

maintaining of all railroad shop equipment below the 10-year mark is not necessary, and it is not recommended that this be done. Some types of machine tools used by the railroads perform a yearly service of only 400 to 500 hr. against an average of probably 2000 hr. in most industrial plants. These tools are absolutely essential to locomotive repairing, but even with the marked improvement in this equipment over that built 20 years ago it would be difficult to justify replacement of the old machines.

There are, however, many tools that could be replaced at the end of 10 years and at a considerable profit, and altho it is quite possible that these are in the majority, a 10-year life standard should not by any means be set for all tools. It should be explained that a 10-year life base is here used merely to indicate the maximum replacement demand possible and to show that railroad earnings are adequate to meet such replacement expenditures.



Of the machine tool equipment which represents an investment of about \$175,000,000 it is probable that much of it is worthless and has not been used in many years. As the average age of all machine tools in place in railroad shops is over 20 years, the age of many of them is 30 and 40 years. With the marked increase in productivity of machine tools during this period, it is obvious that to maintain the same shop capacity fewer tools would need to be purchased than scrapped. It is doubtful, therefore, that an investment of more than \$125,000,000 would be required to replace all tools over 10 years of age.

This \$125,000,000 is a comparatively small part of the total investment of all railroads in motive power and all other types of equipment, and it does not loom large when compared to the net income, after charges, of the Class I railroads in some of the profitable years prior to the depression. In 1929, for example, the net income for these roads was very nearly \$900,000,000, and in 1930 it was in excess of \$500,000,000.

The prospects are good for the

railroads to equal or better their 1930 earnings—and in the not too distant future. For the first nine months of 1936 net income was \$42,000,000 against a loss of \$66,000,000 for the same period of 1935. With the heavy traffic of the last quarter it is quite possible that net income for the full year of 1936 will be close to \$150,000,000, as compared with only about \$7,500,000 for 1935. With present prospects the net operating income for 1937, that is, the income before charges and from operation only, will be equal to that of 1930, although because of a reduction in other income, net income probably will be lower.

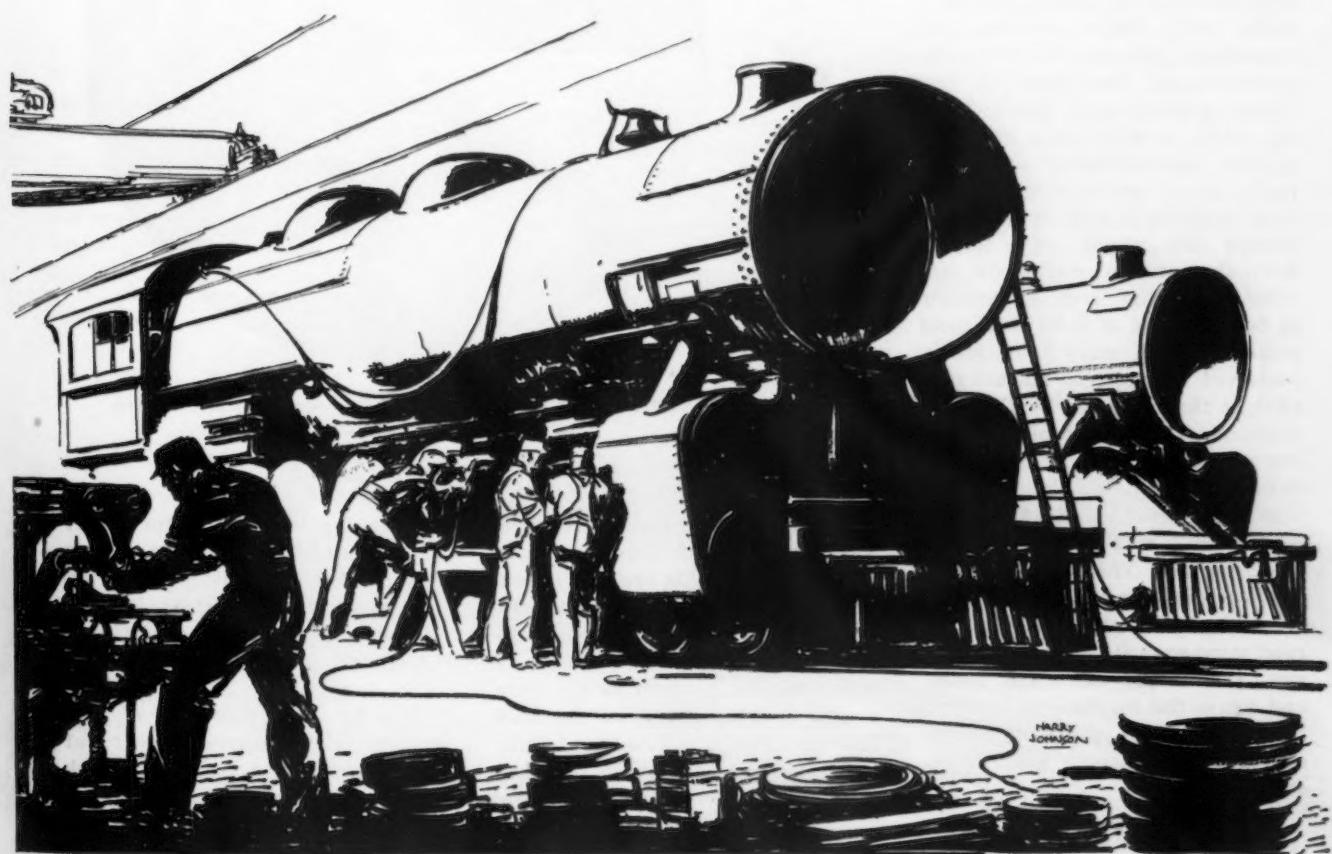
It is thus evident that the railroads could well afford, even in the near-future, to replace all of their obsolete machine tools without serious effect. But even if desired, this would not be possible because the demand would be approximately equal to the normal volume done by the machine tool industry in one year. A five-year program that would replace this obsolete equipment would be more practical, and would, as well, be a scarcely noticed expenditure as

compared with the probable net income of the railroads. And a \$25,000,000 volume of business yearly for five years from the railroads would be a big stimulant to the machine tool industry.

When Would the Investment Be Warranted?

There is probably little doubt in anyone's mind, and least of all in that of the railroad shop man, that modern machine tools could be used to good advantage. It is doubted by some that the railroads can possibly operate efficiently with equipment that averages more than 20 years old. The typical manufacturing plant probably could not, but with the railroad shop a different set of conditions is present.

In the first place, the railroads do not manufacture to sell; their profits are not derived from shop operations. Also, as many repairs are made without the assistance of machine tools, machine tool productiveness does not affect all phases of locomotive work. In addition, very little mass production is possible, most production lots being small, requiring numerous set-ups. This means much idle or non-productive machine time—



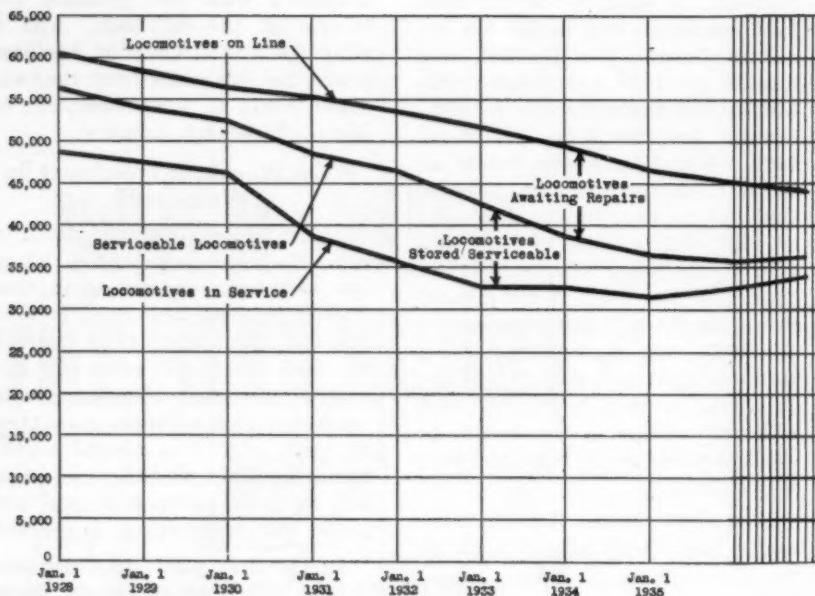


FIG. 1.—The Steam Locomotive Situation (Courtesy *Railway Age*).

hence with the large amount of equipment that must be kept in place for just the occasional job, maximum utilization of facilities is difficult.

Conditions relative to quantities produced have improved considerably, however, in the last few years. With the consolidation of shop facilities into larger working units, with better working arrangements between the stores department and the shops so that larger quantities of stock items are made up at a time, and with greater standardization of many parts, much better utilization of shop facilities is now obtained. Although this would seem to cut down the potential market for machine tools, the greatest number of hours of use of individual tools makes a much more intelligently conceived replacement market possible, so that in the end with faster replacing, the units replaceable in one year would be very nearly the same. In addition, the justification for replacing is more easily determined, making the market easier to sell. Then, there is also the fact that the larger units will receive greater attention by railroad management, because of their size, than numerous small units, and hence the machine tool industry will stand to gain as it has in selling large units in general industry.

In the final analysis, however, the repair shop is not the first

the railroads buy machine tools in volume.

To determine when that time will be, it is necessary to view the situation regarding motive power. From 1924 to the present there has been a steady decline in locomotives on lines, as shown in the chart, Fig. 1. In 1924 the Class I railroads had a total of 65,000 locomotives; today they have 44,000. In 1929, with more freight handled but fewer passengers, there were approximately 7000 less locomotives than in 1924. However, the major decline came during the depression years and was approximately at the rate of 2000 a year. As a result, there are fewer locomotives on lines today than were in service during the early months of 1930.

This steady decline has been offset to some extent by a more efficient utilization of facilities and

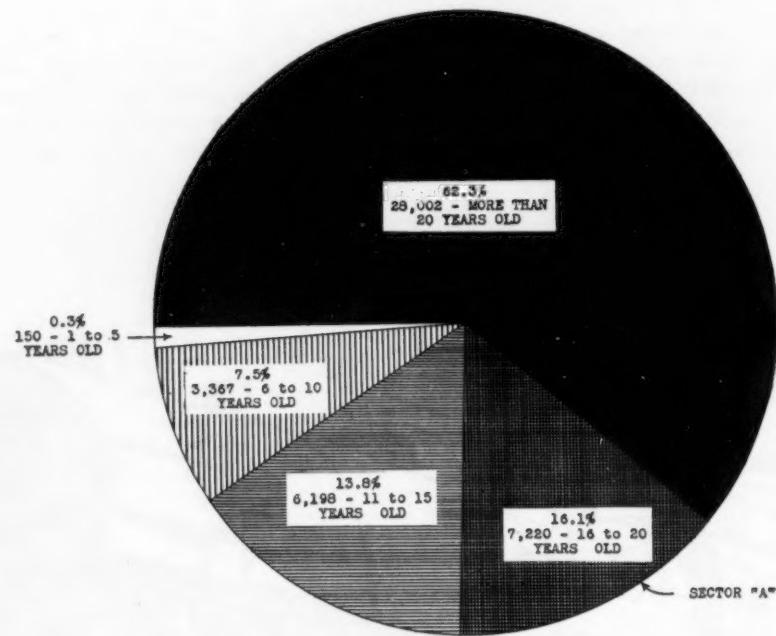


FIG. 2.—Age Distribution of Steam Locomotive Inventory as of Jan. 1, 1936. (Courtesy *Railway Age*).

consideration of railroad officers, although it is obtaining greater recognition. Profits are made from the handling of traffic, and the repair shop is only one factor. In the case of most railroads, it is still true that as long as the shop is able to keep power on the road few questions are asked and little assistance given. But, in the very near future the shop may become of vital importance to the railroads; then, and only then, will

by the increase in tractor power of locomotives in service. From 1924 to 1930 the power of the average locomotive increased about 12 per cent, and from 1930 to 1936 there was a further increase of 6 per cent. The speed of all trains has been markedly stepped up and the average capacity of freight cars has been increased. Hence, the overall efficiency is found to be considerably higher than 10 years ago.

With the improvement in traffic, both freight and passenger, that has taken place in the past 12 months, there arises the question as to whether or not locomotives have been allowed to become obsolete and have been scrapped faster than the roads' efficiency has increased, resulting in possible difficulties with a marked increase in car loadings. This condition is graphically shown in Fig. 1. On Nov. 1, 1936, only about 2300 locomotives were stored serviceable, which is considerably below the number in any of the previous years. Although there was a reduction in the number of locomotives awaiting repairs from approximately 10,000 on Jan. 1, 1935, to less than 8000 on Nov. 1, 1936, there were only approximately 4000 awaiting repairs on Jan. 1, 1930, with about 6000 stored serviceable.

With such a large number of locomotives awaiting repairs and so few available for service on Nov. 1, 1936, the question arises—why repairing has not gone ahead at a more rapid pace and a considerable reduction made in the number of locomotives awaiting repair, with a corresponding increase in those available for service.

Many Locomotives Awaiting Repairs Unfit for Service

According to one authority many of the locomotives awaiting repairs are unfit for service. This statement is verified to a considerable extent by the fact that today over 60 per cent of the locomotives on lines are over 20 years old and 90 per cent are over 10 years of age. Fig. 2 shows this condition clearly, and the small amount of power

under five years of age should be noted. The locomotive situation is somewhat better than indicated by their age because of the amount of rebuilding and modernizing that has taken place. It would be very difficult to determine the effect of this rebuilding on the actual replacement and modernization still needed, but it is doubted that it has had much effect.

The recent and sudden increase in locomotive purchasing would seem to indicate that the railroads are quite conscious of this lack of adequate power. During 1935 only 83 new steam, electric and Diesel locomotives were ordered, but during 1936 to Nov. 30, orders were placed for 305 steam and 49 Diesel electric locomotives, and inquiries outstanding on that date totaled 31 steam locomotives. This is the greatest number of locomotives to be purchased in any one year since 1930, and there is little doubt but that in 1937 orders will greatly exceed these figures.

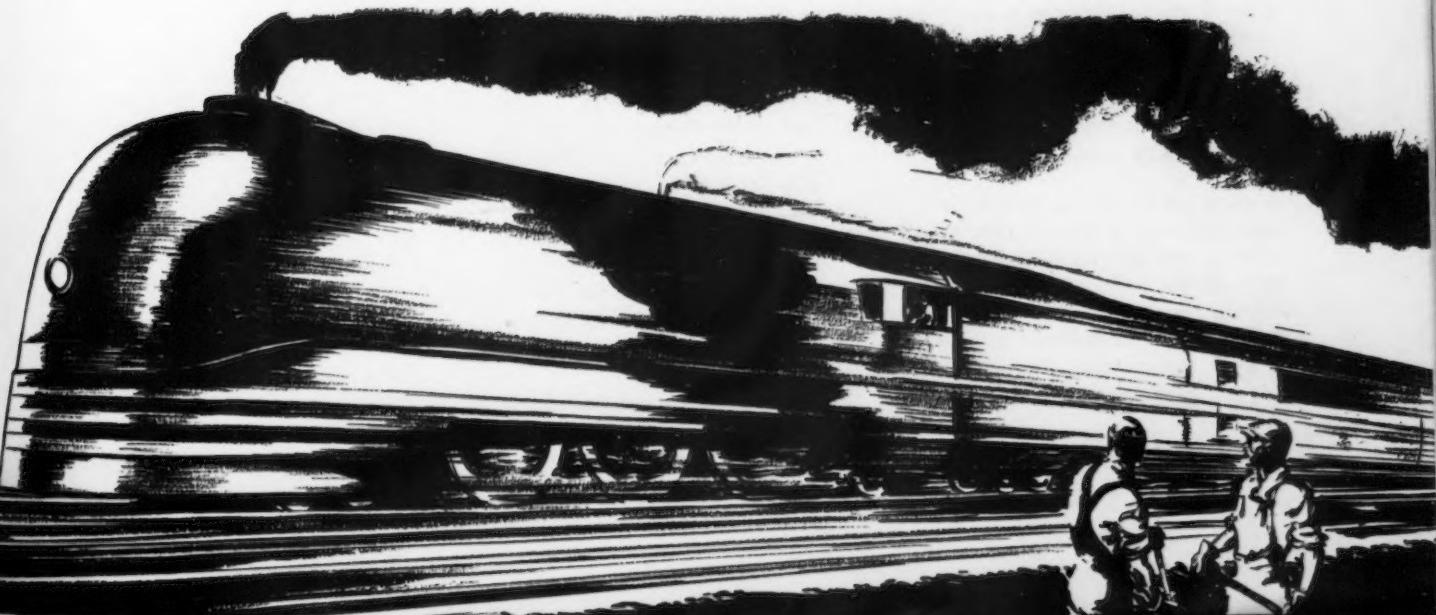
Although orders are being placed for motive power in large numbers, it is doubtful if delivery will be as rapid. It requires considerable time to construct a locomotive, and with the builders' shops having been practically idle for six years, the manning and organizing of these shops for this volume of business will require considerable time. With the prospect that many locomotives will be retired from service during 1937 and that the builders will experience the difficulties outlined above in producing new power, the railroad shops will need to increase productivity considerably to supply sufficient power for the expected increase in car loadings.

Because of the press for more rapid repairing to keep a sufficient supply of power available, plus the construction of new locomotives, the railroad shops will become increasingly busy and the inability of the obsolete machine tool equipment to produce satisfactory work rapidly will become recognized. The railroads will, no doubt, find the same difficulty in obtaining skilled help that industry has found, and the need to furnish every man with tools that will turn out the greatest volume of work will become necessary. This condition will become apparent during 1937 and the railroads will be in the market for machine tools unless some unforeseen decline occurs in general business.

Selling Machine Tools to the Railroads

Even though conditions become favorable for machine tool buying by the railroads, and many orders for equipment are placed in 1937, the large volume that should be derived from this source will not come without some creative selling on the part of the machine tool industry. The potential railroad market for machine tools is smaller today than some years ago, due to the economies effected by shop management, but it still is a sizable market, and with a systematic replacement program, its yearly purchases would amount to 8 to 10 per cent of the machine tool industry's normal volume. It is quite possible that this market is more difficult to sell than some others, but it is doubtful if the railroads require any more effort to sell than other industries buying for replacement.

True creative selling is neces-





MACHINE tools play an important part in locomotive repair work. This heavy machine bay of a modern railroad shop is arranged for work on wheels, axles, and journal boxes.

sary to obtain any great amount of business from the railroads, even when the time is opportune. In approaching the railroad market, however, it must be kept in mind that railroading is not manufacturing. The railroad shops are but an aid to the performance of

a service. This point of view should be taken in advertising as well as in personal selling and the advantage of new tools to speed repairs, rather than to cut costs should be emphasized. Cost cutting will automatically come through the increased output per machine.

As in selling replacement equipment to the manufacturing industries, the officials as well as the shop men must be contacted. It is doubly important to do this in railroad selling, because higher railroad executives are so far removed from the shop problem.



Improved Chucking Facilitates Locomotive Tire and Wheel Center Machining

By M. M. McCALL



FOR many years machining operations in the manufacture of locomotive driving wheel centers and tires have been performed on vertical boring and turning mills and tire boring mills of conventional design. Recent years, however, have witnessed the development of special machines for these operations, which are now installed in the largest tire and wheel center manufacturing plants.

The wheel centers are steel castings. They are turned on their outside diameter, and both sides of the rim are faced. The hub is bored and faced, and the boss for the crankpin and the counterweight is faced.

The tires are forgings rolled to shape and have about $3/16$ to $\frac{1}{4}$ in. metal to be removed from all surfaces. They must be bored and faced and the tread turned to its profile. The bore is usually rough, as the finish boring operation is performed by the purchasers in their own shops on conventional tire boring machines to suit their wheel centers.

The new machines are more powerful and more rugged, and are able to remove metal faster. In their development it was necessary to greatly improve the methods of chucking so that the parts would be held securely while heavier cuts were being taken. Auto-

matic, electric, pneumatic and hydraulic chucking mechanisms have been used on the various machines.

Fig. 1 shows a modification of the conventional tire boring machine, which with different chuck tables and chuck jaws is suitable for operations on both wheel centers and tires.

Two machines are usually arranged for operations on wheel centers, the machining of the opposite sides of the centers being

performed on different machines. The first operation consists of back-facing the hub and turning and facing both sides of the rim. The second operation consists of front-facing the hub, crankpin boss and counterweight. On some wheel centers with large counterweights, when facing the boss for the crankpin it is necessary to chuck the wheel center off center so that the boss may be faced without the tool gouging into the counterweight portion. Angular adjustment of the chuck jaw faces is provided for the off-center chucking.

The upper part of these machines is similar to a regular tire boring mill with fixed crossrail. The bars and saddles have power and hand feed, and rapid power traverse from motors on the rear of each end of the crossrail. The table has a powerful drive from a 50-hp., 4-to-1 motor, the table driving gear being of internal type.

Wheel-Center Machines Have Self-Centering Chucks

The machines for wheel centers are provided with a five-jaw combination self-centering chuck built into the table. Steel chuck jaw slides are traversed by screws driven by suitable gearing from a 5-hp. constant-speed motor mounted on a bracket attached to the

LOCOMOTIVE tire and wheel center manufacturing plants are now equipped with special machines in place of the standard vertical boring mills and conventional tire boring machines employed in former days. Features of these more powerful and more highly productive machines include the electric, pneumatic, and hydraulic chucking mechanisms designed adequately to hold the work for the heavier cuts now possible. Some of the modern chucking methods are described in this article.

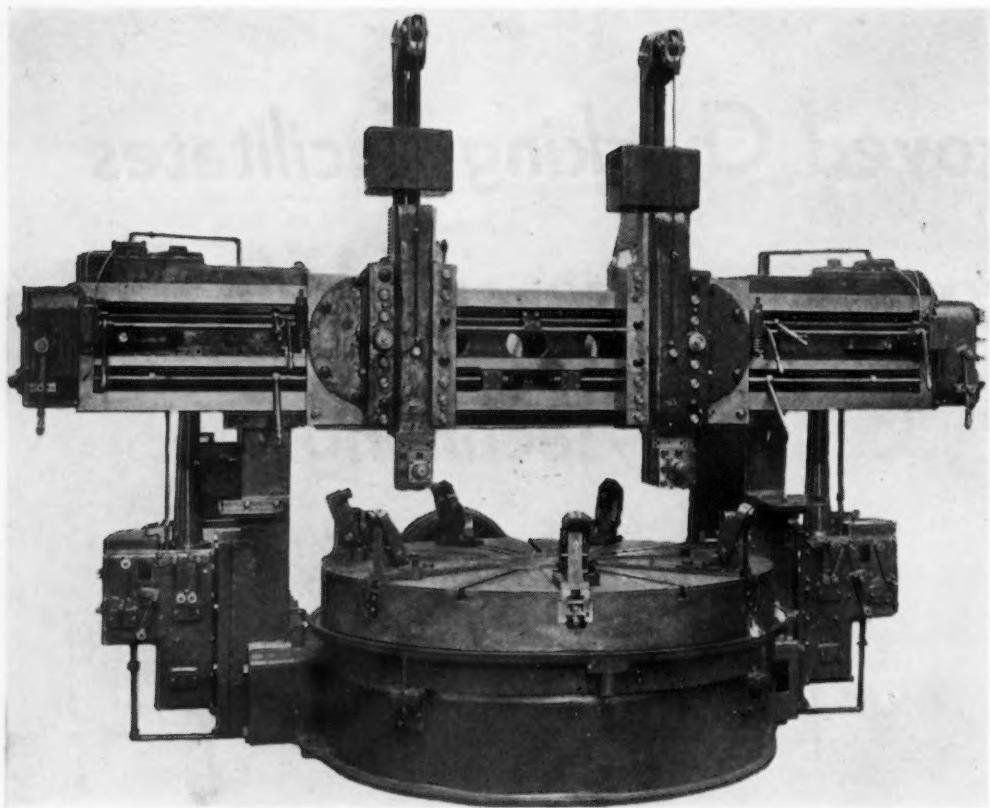


FIG. 1—Special
118-in. heavy ver-
tical boring and turn-
ing mill for opera-
tions on both wheel
centers and tires.
The table is ar-
ranged for chucking
tires.

spindle under the bed of the machine. Each jaw has independent hand adjustment on its slide by means of an additional screw. The chuck jaws are detachable so that other forms of jaws may be substituted if desired. Special serrated drivers, adjustable in height

by means of screws for various types of wheel centers are included in the chucking equipment.

The table unit on the machine for the first operation is provided with a pneumatic clamping device for holding the wheel center by means of clamping through the

center of the wheel hub when machining the periphery and front and back face of the rim. The clamping cylinder and all other mechanism pertaining to the clamping unit are mounted on a bracket attached to the spindle under the bed of the machine.

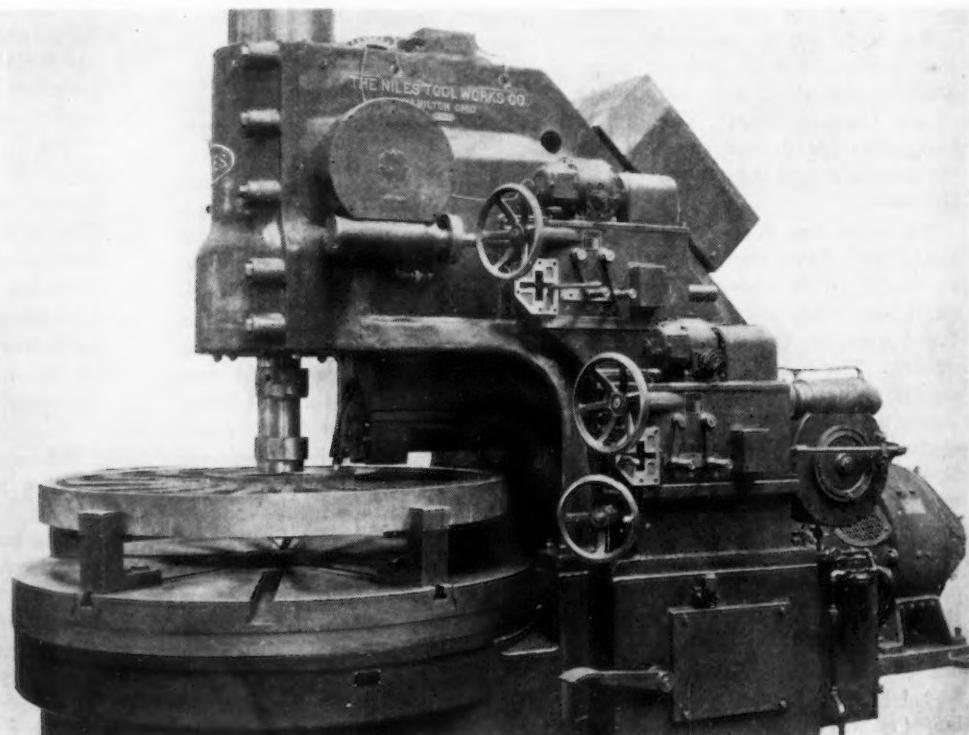


FIG. 2—Heavy 84-
in. wheel - center
boring mill with hub
facing bar. The
special boring tool
with roughing and
finishing cutters is in
place.

Suitable control and air pressure regulating valves are provided. Collector rings are located at the lower end of the spindle for electrical connections to the chuck jaw operating motor.

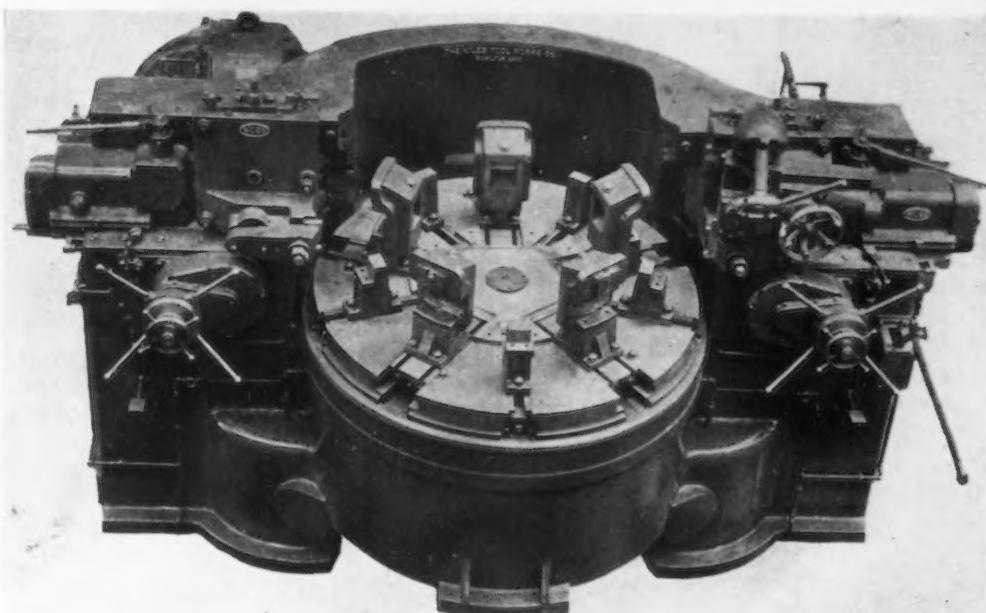
When this type of machine is used for boring tires it is provided with a seven-jaw universal chuck table and the latest design of hook clamps. Fig. 1 shows the chuck table arranged for tire boring. The chuck jaw slides are traversed by a 5 horsepower motor as on the chuck table arranged for wheel centers. When the tire is cen-

4-to-1 motor. When the wheel center is lowered into the chuck and the table starts to rotate, the wheel center will be locked rigidly in the jaws. The heavier the cut, the greater becomes the gripping action of the jaws on the wheel center. When the boring is finished the table drive is reversed, which automatically releases the jaws.

The boring bar is 16½ in. in diameter, counterweighted and keyed against rotation. It is kept in alignment by a tapered take-up bushing, which collapses around

standard tread is turned and formed by full contour tools, the roughing tool being carried by the right-hand side head and the finishing tool by the left-hand side head. Both heads are provided with horizontal feed which may be tripped when the proper diameter is obtained. The tools are carried on vertically adjustable auxiliary slides to line them up with the tire. Fig. 4 is a close-up view of the right-hand head turning a wide-face blind tire, and Fig. 5 shows the right-hand side of machine with a flanged tire in the

FIG. 3—Heavy-duty locomotive tire turning machine. The larger chucks are the hydraulically-operated clamping and driving chucks and the smaller ones are the motor-operated centering chucks. This machine is for tires ranging from 42 to 62 in. in inside diameter. When the machine is built for 48 to 74-in. inside diameter tires, one additional chuck jaw is added to each set.



tered, the hook clamps are swung into contact with the tire and a curved and serrated roller, mounted eccentrically, engages the curved portion of the back of the flange. Due to the eccentricity of the roller, it will bite deeper into the tire as the pressure of the cut increases. As the clamping roller engages the back portion of the flange, the tire may be back-faced on this machine without interference with the chuck jaws or hook clamps.

Special Wheel-Center Boring Unit

Fig. 2 shows a heavy 84-in. wheel-center boring machine—a special tool developed for rough and finish boring of wheel centers, and facing the hub on one side. The machine is provided with a five-jaw automatic self-centering chuck built into the table, which is rotated by a 25-horsepower,

the bar at the throat of the column.

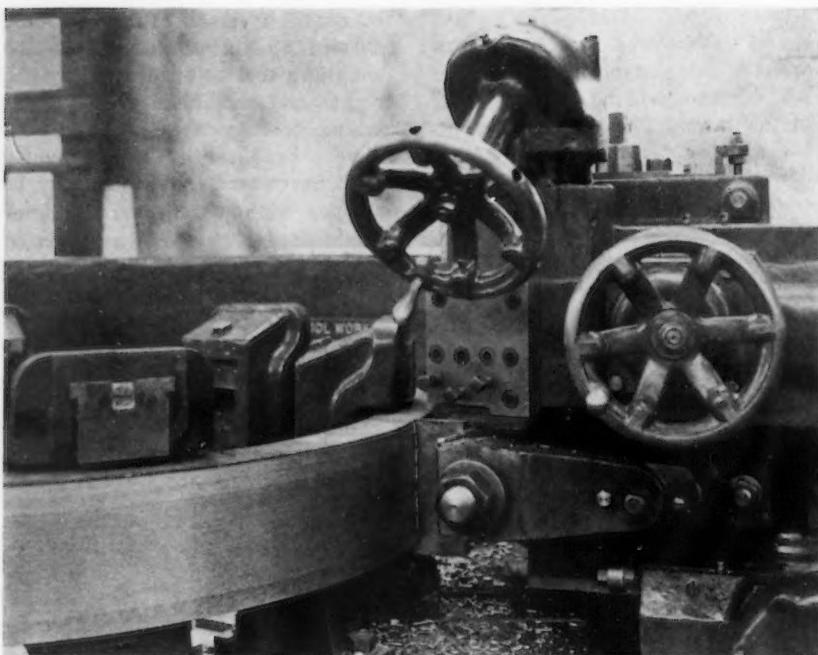
The facing bar is adjustable horizontally through the main body of the column, its upper surface having a bearing built out from the column throat to resist the thrust on the cutting tool. The front end of the bar is gibbed to the column to prevent rotation. Each bar has a separate feed box, hand adjustment, and a motor for rapid power traverse. The facing tool holder is vertically adjustable on the end of the facing bar by means of the lower handwheel, Fig. 2. A trip is provided for the facing feed, the facing being performed simultaneously with the boring operation.

Machine for Turning Locomotive Tires

Fig. 3 shows a powerful, rugged machine developed for the turning of locomotive tires. The A.R.A.

chuck. An auxiliary tool-holder on the right-hand head may be used to face the front of the tire. An idea of the massiveness of this machine may be obtained from the rear view, Fig. 6.

The table is rotated by a 75-horsepower, 4-to-1 motor, its external ring gear being driven by two large pinions. A powerful chucking arrangement is necessary to efficiently chuck the tire. Fig. 7 shows the table and chucking parts which consist essentially of the table, the spindle and the chucking motor base. The table is fastened to the top of the spindle, and the chucking motor base to the lower end. The part of the spindle just below the table forms the main bearing in the bed. The chucking is accomplished by two separate mechanisms. One mechanism is a five-jaw mechanically-operated centering chuck and the other is a five-jaw hydraulically-



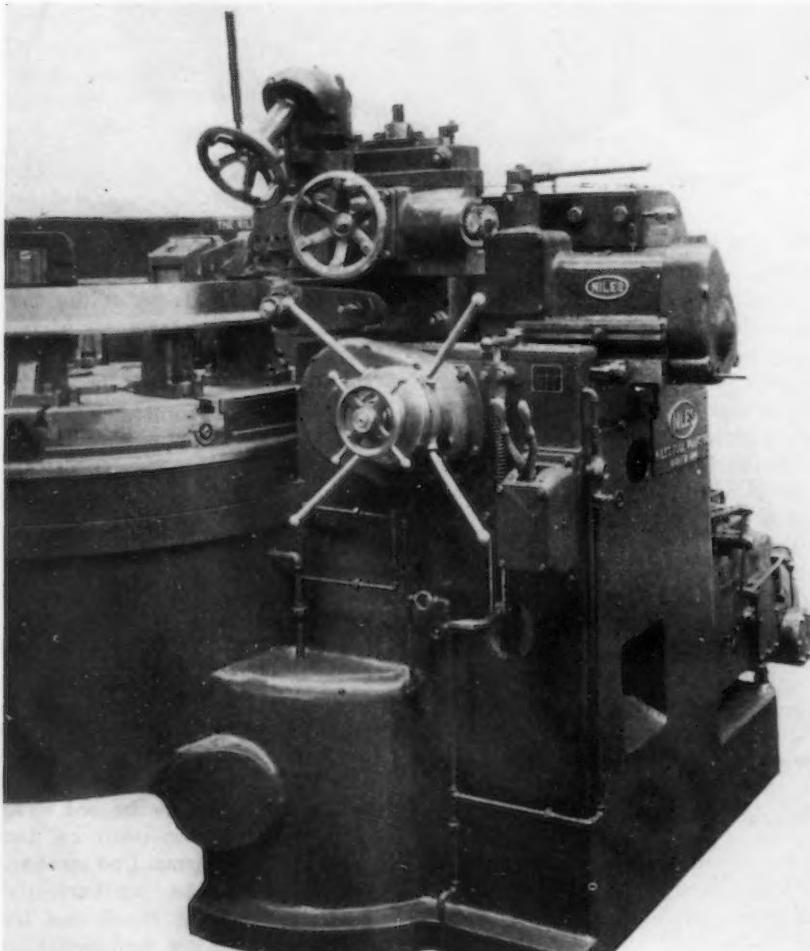
ABOVE

FIG. 4—Close-up view of right-hand head on tire machine turning a wide face blind tire. The angular sliding block with the teeth of the inserted driving jaw may be seen in the foreground.

○ ○ ○

BETWEEN

FIG. 5—Right-hand head of tire machine turning a flanged tire.



operated clamping and driving chuck.

The centering jaws are mounted on serrated slides which are moved simultaneously by screws driven by a $3\frac{1}{2}$ -horsepower motor carried on the chucking motor base. The clamping and driving jaws are mounted on slides which are moved by hydraulic pressure in cylinders under the slides. The hydraulic pressure is supplied by an oil gear pump driven by a 2-horsepower motor on the chucking motor base. Pipes from the pump pass up through the spindle to a manifold at the top of the spindle. Pipes



FIG. 7—Table, spindle and chucking units of tire turning machine. The motor in the foreground, on the chucking motor base, operates the centering chucks and the motor in the rear drives an Oilgear pump to operate the clamping and driving chucks. Collector rings are visible underneath.

from the manifold connect to each cylinder.

Tire Clamped Hydraulically

When the tire is centered by means of the centering chucks, the hydraulic clamping and driving chucks are moved by hydraulic pressure against the inside diameter of the tire. The serrated driving jaw is inserted in a block which slides in angular slots in the chuck body. An extension from the sliding block is the member which contacts the tire as the chuck body is moved toward it. When this extension contacts the tire, the horizontal movement of

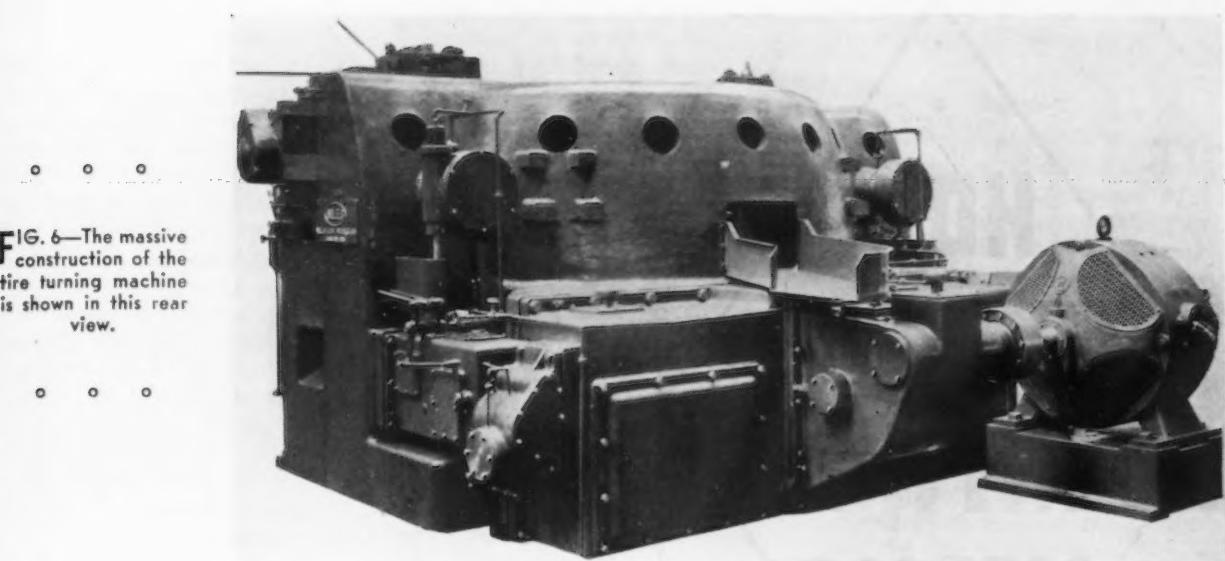


FIG. 6—The massive construction of the tire turning machine is shown in this rear view.

the block is stopped, but as the block is guided in angular slots in the chuck body, the continued horizontal movement of the chuck body will cause the block to move downward until the clamping jaw clamps down on the face of the tire. When the cut is started, the teeth will bite deeper into the tire as the jaw is set into the block on

an angle, the wedging action of which causes them to grip tighter as the pressure of the cut increases.

When a facing cut is to be taken on the tire, the hydraulic jaws must be withdrawn and serrated rollers, which are eccentrically mounted on top of the centering jaws, are used to drive the inside

diameter of the tire during the facing operation.

As the chucking motors and the Oilgear pump rotate with the spindle, all electrical connections for operating these motors as well as the solenoids for controlling the hydraulic valves on the pump are made through collector rings at the lower end of the spindle.

Steel Houses Being Built in Middletown

AT Middletown, Ohio, workmen are putting finishing touches to an entire city block of steel houses—six in all. In the same section, four other steel houses have been serving their owners for several years.

With two companies engaged in the manufacture of steel houses and with the American Rolling Mill Co. taking active interest in the development of this new type

dwelling, Middletown is assuming the leadership in what many experts believe will be America's next big industry—the mass production of low-cost houses.

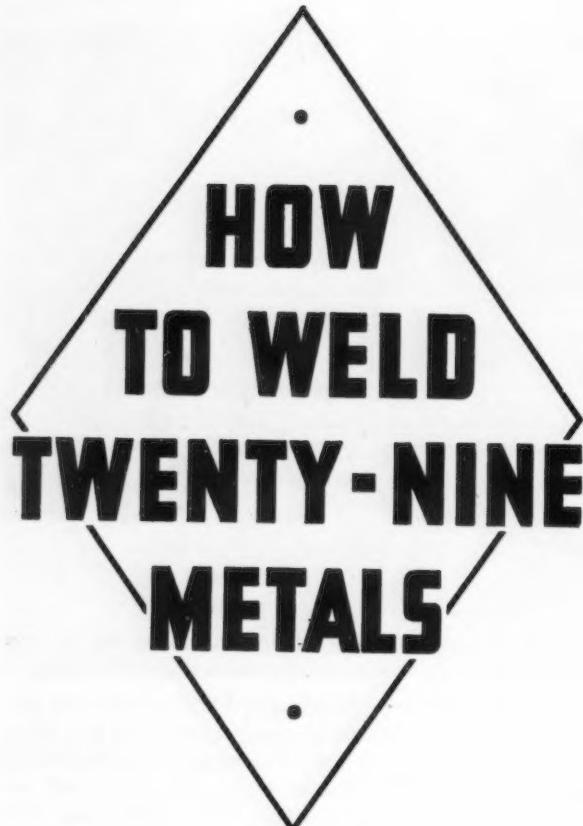
Two Middletown companies—Steel Buildings, Inc., and the Insulated Steel Construction Co.—are producing self-framing steel houses for approximately the cost of conventional construction.

"Various investigators state that the number of residential units that

should be built is from 400,000 to 750,000 units annually for the next 10 years," said Charles R. Hook, president of Armeo. "There is no doubt in my mind that the building of modern homes at prices the great majority of people can afford to pay is one of the most important problems facing the country today. The solution lies in the mass production of houses with its resulting lowering of cost and increase of employment."



HERE are four steel houses in a row—occupying an entire city block in Middletown, Ohio.



HOW TO WELD TWENTY-NINE METALS

By CHARLES H. JENNINGS

*Engineer in Charge of Welding
Research, Westinghouse Electric
& Mfg. Co.*

THIS is the sixth article in an extensive series by Mr. Jennings. The first installment appeared in The Iron Age of Dec. 24, the second on Dec. 31, the third on Jan. 14, the fourth on Jan. 21 and the fifth on Feb. 4. Subsequent chapters will appear in ensuing issues.

Everdur

EVERDUR is a copper-silicon-manganese alloy containing about 3.0 per cent silicon, 1.0 per cent manganese, and the remainder copper. The physical properties of Everdur are dependent upon the degree of cold working. Typical physical properties are given in Table XLII.

Everdur may be successfully

welded both by the metallic arc and the carbon arc processes. In general the carbon arc process is preferred. The resultant welds in each case, however, will develop good ductility and tensile strengths of about 50,000 lb. sq. in.

When welding this alloy, Everdur filler rods should be used. These rods are generally of the bare type, although a thin coating consisting of a flux mentioned later may be applied to them.

When making butt welds, beveling is not required on plates less than $\frac{1}{4}$ in. thick. Plates over $\frac{1}{4}$ in. in thickness should be beveled to an included angle of 90 deg.

Fillet welds are made in the conventional manner. The joints may be welded with the parts in the normal position or tilted 90 deg. with the horizontal so as to form a trough to hold the deposited metal.

Because of the relatively low melting temperature of Everdur (1868°F.), the pool of molten metal is generally larger than it is under similar conditions with steel. In order to prevent the bottom of the weld from falling away, it is desirable to use a back-up bar. Copper is generally employed for this purpose, but cast iron or thick steel sections can be used.

When welding sheets or plates of hot-rolled Everdur, it is desirable to remove the black oxide (CuO) which sometimes gives trouble from welding. Grinding, machining, sandblasting or pickling in a 5 to 10 per cent sulphuric acid solution at 1450°F. will be effective. When a machined surface is used in forming a joint this surface need not be given any additional cleaning treatment.

The use of a welding flux is recommended for the best results. The flux should be composed of 90 per cent fused borax and 10 per cent sodium fluoride. It is sparingly applied to the joint prior to each deposit of weld metal either dry or mixed with alcohol. The quantity of flux should be very small. Water should never be used to

TABLE XLII
Physical Properties of Everdur

	Yield Point Lb. Sq. In.	Tensile Strength Lb. Sq. In.	Elongation Per Cent In 2 In.	Reduction In Area Per Cent
Soft Sheet	20,700	53,700	84.0	69.0
Hard Sheet	75,000	91,500	21.0	47.0

make a paste with the flux as it will result in porous welds.

The welding of Everdur should be carried out as rapidly as possible in order to reduce the heat flow to the base material to the minimum. As short an arc as possible should be held and excessive puddling should be prevented.

Small diameter carbon electrodes about $\frac{1}{8}$ in. in diameter are preferred. The currents used will vary depending upon the thickness of the parts welded.

The filler rod should be held almost parallel to the surface of the plates. The carbon electrode should be pointed so as to direct the arc back onto the deposited metal. If the arc is directed toward the filler rod, slag may get ahead of the weld and become entrapped.

Peening is helpful in reducing residual stresses and eliminating cracks. Such cold working will make the joint brittle, however, and should not be done unless it is subsequently annealed either by heat treatment or by a subsequent layer of weld metal.

Annealing of the weld will relieve residual stresses, but it will not improve the structure of the joint unless the weld metal has first been cold worked as is the case when peening is used. Cold work followed by an anneal of approximately 1200°F. improves Everdur welds in both tensile strength and ductility.

Metallic Arc Welding

Metallic arc welding on Everdur is carried out with bare type Everdur electrodes, using reverse polarity. The recommended welding electrode to use for a given size plate and the proper welding currents are given in Table XLIII.

TABLE XLIII

Electrode Diameter and Currents for Everdur Welding

Plate Thickness (Inches)	Electrode Diameter (Inches)	Welding Current (Amperes)
up to $\frac{1}{4}$	$\frac{1}{8}$	90-140
$\frac{1}{4}$ to $\frac{1}{2}$	$\frac{3}{16}$	190-210
$\frac{1}{2}$ and over.....	$\frac{7}{16}$	190-240

The design of butt joints used when welding by the metallic arc process are similar to those used when welding with the carbon arc process. When making large fillet welds, tilting of the joint to an angle of 90 deg. with the horizontal is recommended.

When starting a weld special precautions are sometimes required to obtain good fusion. Preheating at the point where the weld is to be started will insure 100 per cent fusion at the start.

Peening is desirable to eliminate residual stresses and its use should be governed by the conditions mentioned in connection with carbon arc welding.

Metallic arc welds in the "as welded" condition will develop tensile strengths of about 90 per cent of the base metal. The ductility of the welds will also be less than that of the base metal. Proper cold working and annealing of the welds will improve both the tensile strength and ductility of metallic arc welds.

Welding Everdur to Steel

Everdur may be welded to steel by either the carbon or metallic arc processes. The method used will depend upon the design of the structure and the experience of the operator doing the welding.

The principles outlined for weld-

ing Everdur to Everdur will apply when welding Everdur to steel.

Herculoy

Herculoy is a copper-silicon-tin alloy having a tensile strength of 55-65,000 lb. sq. in. combined with good ductility. This material has good weldability and can be welded either by the carbon arc or metallic arc process. In general, however, the carbon arc process is preferred.

When carbon arc welding is used, preheating is not necessary and bare Herculoy type filler rods are satisfactory. For sound welds, it is recommended that a flux consisting of 90 per cent fused borax and 10 per cent sodium fluoride be used. This flux should be used sparingly and will be found very effective in floating oxides and dirt to the surface. If the dry flux tends to blow off the joint, a paste may be formed by mixing the flux with alcohol and this paste painted on the joint.

For metallic arc welding either bare or coated Herculoy electrodes

TABLE XLIV
Data on Carbon-Arc Welding of Herculoy

Metal Thickness	No. Beads	Bead Number	Welding Rod Dia.	Carbon Dia.	Welding Current Amps.	Type of Edge	Spacing Between Edges
$\frac{1}{2}$ in.	1	1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	50	Flange or $\frac{1}{16}$ in. lap
$\frac{1}{8}$ in.	1	1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	100	Straight butt
$\frac{1}{16}$ in.	1	1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	160	Straight butt	$\frac{1}{16}$ in.
$\frac{1}{8}$ in.	1	1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	220	Straight butt	$\frac{1}{16}$ in.
$\frac{1}{4}$ in.	1	1	$\frac{1}{8}$ in.	$\frac{1}{8}$ in.	280	Straight butt	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	2	{ 1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	240	Single V 30 deg. bevel	$\frac{1}{8}$ in.
		2	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{16}$ in.	3	{ 1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	240	Single V 30 deg. bevel	$\frac{1}{8}$ in.
		2	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
		3	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350		
$\frac{1}{16}$ in.	3	{ 1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	240	Single V 30 deg. bevel	$\frac{1}{8}$ in.
		2	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	330		
		3	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350		
$\frac{1}{8}$ in.	4	Top V { 1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250	Double V 30 deg. bevel	$\frac{1}{8}$ in.
		2	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350		
$\frac{1}{8}$ in.	4	Bottom V { 1	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
		2	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 2	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
		3	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350		
$\frac{1}{8}$ in.	4	Top V { 3	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250	Bottom V { 1	$\frac{1}{8}$ in.
		4	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350		
$\frac{1}{8}$ in.	4	Bottom V { 2	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 3	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 4	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 5	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 6	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 7	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 8	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 9	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 10	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 11	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 12	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 13	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 14	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 15	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 16	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 17	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 18	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 19	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 20	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 21	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 22	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 23	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 24	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 25	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 26	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 27	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 28	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 29	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 30	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 31	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 32	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 33	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 34	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 35	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 36	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 37	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 38	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 39	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 40	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 41	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 42	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 43	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 44	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 45	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 46	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 47	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 48	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 49	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 50	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 51	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 52	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 53	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 54	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 55	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 56	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	300		
$\frac{1}{8}$ in.	4	Bottom V { 57	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	380	Top V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Top V { 58	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	250		
$\frac{1}{8}$ in.	4	Top V { 59	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Top V { 60	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	350	Bottom V { 1	$\frac{1}{8}$ in.
$\frac{1}{8}$ in.	4	Bottom V { 61	$\frac{1}{16}$ in.	$\frac{1}{16}$ in.	280		
$\frac{1}{8}$ in.	4	Bottom V { 62	$\$				

may be used. Reverse polarity is essential. In order to obtain complete fusion at the start on heavy plates, local preheating is required.

When welding material less than $\frac{1}{4}$ in. thick the weld should be completed in one pass both with the carbon and metallic arc processes. Plates over $\frac{1}{4}$ in. thick should be beveled to a 60 deg. included angle and the weld deposited in multiple passes. The number of passes will be a function of the thickness of the plates.

Complete fusion at the bottom of the joint is best obtained by spacing the root of the joint and using a back-up strip. When welding a double vee-type joint, a wedge-shaped back-up should be used in the underside of the joint.

Speed is important if good welds are to be obtained on Herculoy. The faster the weld is deposited with complete fusion, the better is the quality and soundness of the weld.

In general, vertical and overhead welding are not recommended.

A relatively long arc corresponding to an arc voltage of 30 to 40 volts is recommended when welding Herculoy by the carbon arc process. Pertinent data for this class of welding are given in Table XLIV.*

The recommended electrode diameter and welding current to use when welding Herculoy by the metallic arc process are given in Table XLV.*

The tensile strength of carbon arc welds will range from 50,000 to 60,000 lb. sq. in., while the tensile strength of metallic arc welds will range from 60,000 to 70,000 lb. sq. in. Good ductility values are obtained in both cases.

Monel Metal

Monel Metal is a nickel-copper alloy having excellent strength, ductility, and corrosion-resisting properties. Ordinarily Monel Metal cannot be hardened by heat treatment although its tensile strength can be greatly increased by cold working. The addition of aluminum to form what is known as type-K Monel Metal results in a heat-treatable material. The heat treatment hardening of type-K Monel Metal is accomplished by a form of precipitation hardening.

*See R. Steinmetz on "The Welding of Herculoy," *Welding Engineer*, April, 1936.

TABLE XLVI
Chemical Analysis of Monel Metal

Nickel	68.00 per cent
Copper	29.00 per cent
Iron	1.50 per cent
Manganese	1.10 per cent
Silicon	0.10 per cent
Carbon	0.15 per cent

*See R. Steinmetz on "The Welding of Herculoy," *Welding Engineer*, April, 1936.

The typical chemical analysis and physical properties of Monel Metal are given in Table XLVI.

The arc welding of Monel Metal may be accomplished by both the metallic and the carbon arc processes. Coated electrodes or filler metal is required with reverse polarity being used with the metallic arc process. Aluminum wire is generally wrapped in a spiral around monel metal electrodes to insure the best welds. The aluminum acts as a deoxidizer and prevents porosity in the deposited metal.

The metallic arc process is adapted to plates ranging from 24 gage up. The carbon arc process is best adapted to light gage materials ranging from 24 to 16 gage although it can be used on heavier sections.

Typical electrode diameters and current values recommended for different thicknesses of plates are given in Table XLVII.

Thin plates may be butt welded

without beveling the plate edges. Heavier plates should be beveled to an included angle of 90 deg.

The high coefficient of expansion of Monel Metal may cause trouble from buckling unless jigs are used. The use of jigs and the proper welding procedure will make it possible to weld Monel Metal without any more difficulty than is obtained from welding ordinary steel plates.

Metallic arc welding is faster than carbon arc welding and the resultant welds have greater ductility. Welds made with the metallic arc process will withstand a 180 deg. bend without fracture. Carbon arc welds will only withstand a 160 deg. bend before fracture.

Tensile properties of welds made on ordinary Monel Metal will range from 75,000 to 90,000 lb. sq. in. Welds made on type-K Monel Metal will have tensile strength from 90,000-95,000 lb. sq. in. and an elongation in 2 in. of 40-45 per cent after stress relieving at 1077°F. for 3 hours.

Monel metal can be readily welded to steel plates. The metallic arc process is recommended in this case and the physical properties of the welds are very satisfactory.

Nickel

Nickel is essentially a pure metal containing less than one per cent of impurities. It has a great affin-

TABLE XLV
Recommended Currents for Welding Herculoy Plates and Sheets with the Metallic Arc

Metal	Arc Voltage	Welding Current (Amperes)	Electrode Diam. (Inches)
Thickness (Inches)			
$\frac{1}{8}$ and under.....	25-30	100-125	$\frac{1}{8}$
$\frac{1}{4}$	25-30	150-175	$\frac{3}{16}$
$\frac{3}{8}$	25-30	200-225	$\frac{7}{16}$
$\frac{1}{2}$	30-35	250-275	$\frac{1}{4}$
Over $\frac{1}{2}$	30-35	275-350	$\frac{1}{4}$ - $\frac{3}{8}$

Treatment	Yield Point Lb. Sq. In.	Tensile Strength Lb. Sq. In.	Elongation, Per Cent in 2 In.	
			As rolled	40-90,000
Annealed 1700-1750° deg. for 5 min.		25-45,000	70- 85,000	

TABLE XLVI—Continued
Physical Properties of Monel Metal

Plate Thickness	Electrode Diameter (Inches)	Current (Amperes)	Metallic Arc		Carbon Arc*	
			Electrode Diameter (Inches)	Current (Amperes)	Carbon Diameter (Inches)	Current (Amperes)
24-16 gage	$\frac{1}{8}$	45-55	$\frac{1}{8}$	45-55	$\frac{1}{8}$	33-43
18-12 gage	$\frac{3}{16}$	50-70	$\frac{3}{16}$	50-70	$\frac{3}{16}$	43-55
12- 9 gage	$\frac{1}{8}$	70-85	$\frac{1}{8}$	70-85	$\frac{1}{8}$	55-63
9 gage to $\frac{1}{4}$ in.....	$\frac{3}{16}$	85-105	$\frac{1}{8}$	85-105	$\frac{1}{8}$	63-72
$\frac{1}{4}$ in. to $\frac{1}{2}$ in.....	$\frac{1}{4}$	145				

*A short arc should be used in the carbon arc process.

TABLE XLVII
Relation Between Electrode Diameter and Welding Current for Monel Metal

Plate Thickness	Electrode Diameter (Inches)	Current (Amperes)	Metallic Arc		Carbon Arc*	
			Electrode Diameter (Inches)	Current (Amperes)	Carbon Diameter (Inches)	Current (Amperes)
24-16 gage	$\frac{1}{8}$	45-55	$\frac{1}{8}$	45-55	$\frac{1}{8}$	33-43
18-12 gage	$\frac{3}{16}$	50-70	$\frac{3}{16}$	50-70	$\frac{3}{16}$	43-55
12- 9 gage	$\frac{1}{8}$	70-85	$\frac{1}{8}$	70-85	$\frac{1}{8}$	55-63
9 gage to $\frac{1}{4}$ in.....	$\frac{3}{16}$	85-105	$\frac{1}{8}$	85-105	$\frac{1}{8}$	63-72
$\frac{1}{4}$ in. to $\frac{1}{2}$ in.....	$\frac{1}{4}$	145				

ity for gases when in the molten state, but throws them off again when it solidifies, thereby forming gas pockets in the weld. The addition of certain elements such as titanium and magnesium in controlled amounts reduce this gaseous condition. As a result, electrodes containing such alloy elements must be used to produce satisfactory welds.

The typical chemical analysis and physical properties of nickel are given in Table XLVIII.

The arc welding of nickel can be done by both the metallic and the carbon arc process. Coated electrodes or filler rods are required with reverse polarity being used with the metallic arc process.

The recommended welding procedures are similar to those used when welding Monel Metal. The resultant welds have high tensile strength combined with good ductility.

Nickel can be satisfactorily welded to steel with tensile strengths ranging from 50,000 to 60,000 lb. sq. in. In order to obtain the best results, a special welding procedure should be used. On butt welds the plate edges should be beveled to 35 deg. (70 deg. included angle). A thin layer of nickel should be deposited on the kerf surface of the steel plate before assembling the joint. After the joint is prepared in this manner the weld can be made in the normal manner by using nickel electrodes.

Bronze

The composition and physical properties of bronzes vary over a wide range; consequently they will be considered as a group. In general they are more readily welded than copper because they have a lower heat conductivity.

Both the metallic and carbon arc processes can be used. Either bare or coated electrodes may be used with the metallic arc process. Reverse polarity is used in all cases and the composition of the electrode will depend upon the type of brass being welded. Phosphorus-bronze welds very well on most types of bronze and good physical properties are obtained. If good color match is required, however, the analysis of the electrode should approximate that of the base metal.

Bronzes have a low melting temperature and are very fluid when

TABLE XLVIII
Chemical Analysis of Nickel

Nickel	99.40 per cent
Copper	0.10 per cent
Iron	0.15 per cent
Manganese	0.15 per cent
Silicon	0.10 per cent
Carbon	0.10 per cent

Physical Properties of Nickel

Treatment	Yield Point Lb. Sq. In.	Tensile Strength Lb. Sq. In.	Elongation Percent in 2 In.
Hot Rolled Annealed.....	30-75,000	70-100,000	30-60
1650-1700 deg. for 5 min.....	20-27,000	65- 80,000	55-65

molten; consequently the best results are obtained from downhand welding. Coated electrodes are recommended for vertical welding. Overhead welding should be avoided.

Fillet welds may be made in the normal position or tilted 90 deg. with the horizontal. Plates over $\frac{1}{4}$ in. in thickness should be beveled to an including angle of 90 deg. when being butt welded.

A large arc as outlined for copper welding should be used when welding with the carbon arc.

Brass

Brasses contain zinc which volatilizes during welding thereby changing the chemical analysis of the base metal at the fusion zone and producing porosity in the weld. In addition to the previous items, the volatilization of zinc tends to prevent good fusion. The lower the zinc content the better is the weldability of brass.

Both the metallic and the carbon arc processes can be used to weld brass. Bare filler metal is preferred when using the carbon arc process. Both bare and coated electrodes

TO THOSE DESIRING REPRINTS

THE IRON AGE has been deluged with requests for reprints of this series; "How to Weld 29 Metals," by Charles H. Jennings. We wish to inform those desiring this material in permanent and collected form that it is being published as a booklet by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Inquiries should be sent to the company at the above address.

can be used when welding with the metallic arc process. The coated electrodes are preferred.

The electrodes used with both processes are generally phosphorus bronze. The use of brass electrodes is generally unsatisfactory.

When welding brass it is important to keep the arc from being directed onto the base metal. It is recommended that the arc be directed on the deposited metal thereby heating the base metal by conduction. This process prevents the overheating of the base metal and the volatilization of zinc. A joint made in this manner is essentially a brazed and not a fusion joint. The bond is excellent, however, and the strength obtained is entirely satisfactory.

Japan Short of Pig Iron

A RECENT report to the U. S. Bureau of Foreign and Domestic Commerce from Commercial Attaché Frank S. Williams, Tokio, is of interest in line with reported heavy pig iron purchases by Japan in this country. Reflecting year-end conditions in the Japanese industry, the report states:

"The iron and steel market has been featured by a spectacular advance in prices, reflecting active demand, depleted stocks and increase in raw material prices. A definite shortage in pig iron has resulted from the increase in consumption, decline in production and sharp reduction in imports. Another factor contributing to the shortage has been the advance in scrap iron prices as compared with those for pig iron, which has stimulated consumption of the latter. It is probable that the shortage will curtail production of finished steel over the next several months and lead to imports of pig iron from the United States and Europe."



Stack Flame

• • •
By B. F. ORR

*Superintendent, Car Shops, Cleveland,
Cincinnati, Chicago & St. Louis Rail-
road, Beech Grove, Ind.*

• • •

RIVET "washing" is the first step in tearing down cars preparatory to rebuilding.

STACK flame cutting, in which several layers of steel plates are stacked together and a multiplicity of parts turned out at one time, with obvious advantages in cost and in speed of production, is being used increasingly. The set-up and advantages of the process in putting through a heavy

repair freight car program are described in this article, abstracted from a paper by Mr. Orr at the recent convention of the International Acetylene Association. Mr. Orr has been in close contact with railroad shop problems for more than 30 years, particularly in the building and maintenance of rolling stock.

mands of the fabricating shop and permits the economical cutting of four different parts of large dimensions in progression.

The cutting machine is automatically guided by means of full-size templates, the guiding member being an aluminum rail suitably fixed to a base. As all the operations performed by the cutting machine are repeated at intervals, permanent templates have been constructed. Because of the large size of the parts cut and the corresponding size of the templates considerable study was devoted to the development of a template base which would meet the requirements of both strength and lightness. The material selected is $\frac{3}{8}$ in. plywood properly reinforced by $\frac{3}{8} \times 1\frac{1}{2}$ in. strips attached to the underside with wood screws. The larger templates are made in skeleton form to reduce the quantity of material used and are designed to provide a secure base along the line of cut. When in use the templates are bolted to the top of the cutting machine table and only the original adjustment is required, as the templates are positioned with relation to permanently located jigs and stops. Change from one operation to another consumes little time as the templates can be

TO meet the demands of modern mass transportation it has been necessary for the railroads to set up heavy repair programs on production line schedules with movements or deliveries of cars within time periods of 18 to 24 min. Maintenance of the production line schedules is dependent upon the ability of the fabrication department to furnish on time new material or parts for replacement of those which are unfit for further service.

The fabrication department is called upon to manufacture thousands of identical pieces during the course of a regular heavy repair program, and the development of stack cutting of plate material by

the oxy-acetylene flame cutting process has proved the greatest step forward in fabrication methods in years.

As the term implies, stack cutting means the cutting, by the oxy-acetylene process, of sheets or plates piled one upon another to a definitely determined height. It is, of course, evident that in this the cutting torch must be moved over the stack mechanically to obtain smoothly and accurately cut edges and that it is, therefore, a machine operation.

The machine installed at our shop has a cutting range of 81 in. transversely and 24 ft. longitudinally. This large capacity was provided to meet the production de-

Cutting of Freight Car Parts

exchanged without further adjustment of position.

The stacks of sheets or plates are supported by jigs mounted on channel section beams which extend the full length of the machine and are supported in turn by the work-supports furnished with the cutting machine. The jigs are constructed of $\frac{3}{8}$ x 3 in. steel bars in skeleton form, the outline being slightly smaller than the contour of the part to be cut. The outline of the jig is within the limits of the finished contour to provide clearance for the cutting stream and the slag of the oxy-acetylene cutting reaction. The material is placed upon these jigs by a labor gang, and removable stop keys are provided to definitely locate each stack of material without any adjustment after it has been piled.

When in use, the stop keys are held in place by slots permanently welded to the channel beams. One edge of the slot or keyway is vertical and the other is tapered. As with this design it is not possible for the stop to move out of position, accurate placing of the material at each loading is assured. Provision has been made to work various sizes of plate stock from the same keyways or slots by making offset keys either extending beyond or receding from the vertical edge of the keyways. All keys or stops are identified by markings indicating the specific operation they are to be used on and the location of the stop slot in which they are to be placed. Thus a change of stop arrangement can be made rapidly and no delay in the loading operation occurs.

Plates Loaded By Labor Gang

Loading of the plate material is performed by a labor gang consisting of two men, who also assist

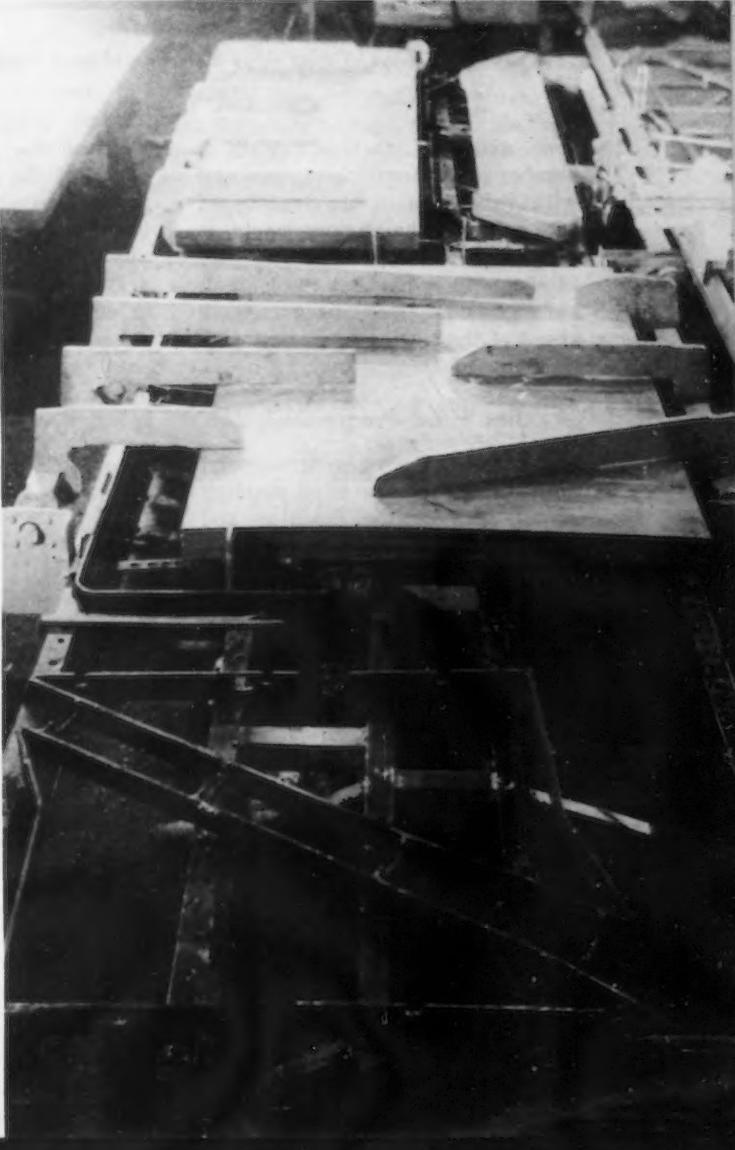
in unloading the cut material by overhead crane and separating the cut sheet sections for subsequent handling by punch operators. The labor gang loads the sheets on to the jigs from stock piles conveniently located adjacent to them. The sheets are loaded one at a time so that visual inspection of surface condition may be made, the surface can be cleaned and any matter which might prevent bringing the sheets in close contact for the cutting operation can be removed. Sheets or plates having

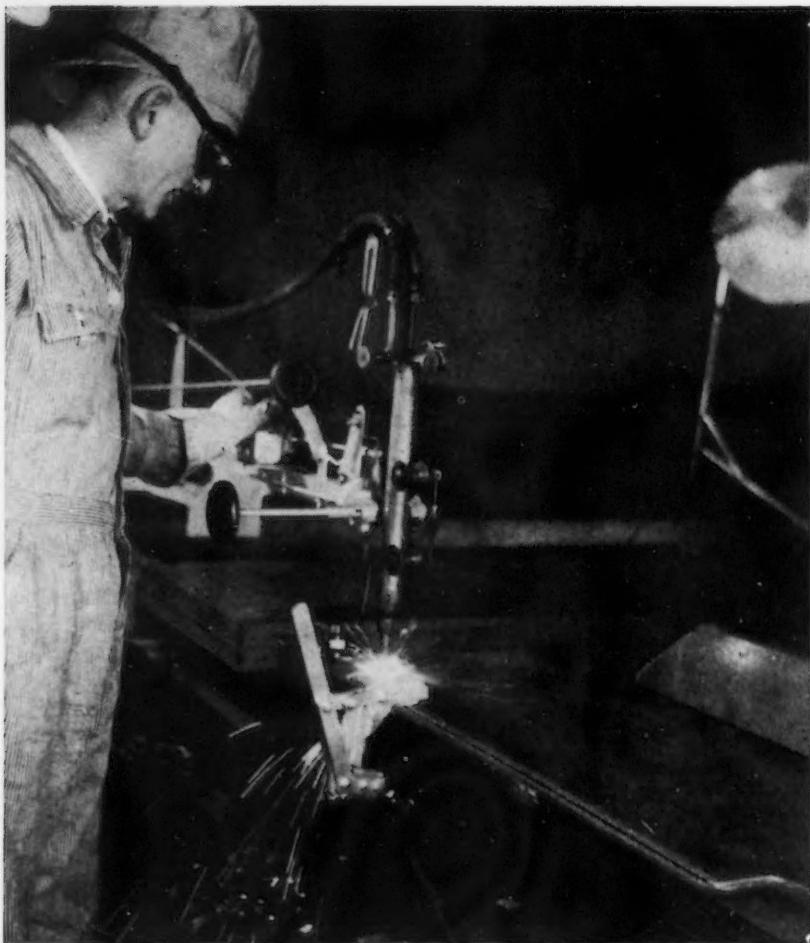
kinked or buckled edges are straightened before being placed in the stacks, in order to avoid separation of the material while cutting. This preliminary preparation has a very definite value, as by careful loading a good clean cut is obtained without any interruption.

Where material $\frac{1}{4}$ -in. thick is used, the sheets are loaded 12 high, the stack thickness being nominally 3 in. The reason for stacking to this thickness has been developed through careful study of

PLATES ready for stack cutting. **Foreground:** Jigs for inside hopper plates. **Middle:** Stacked plates for outside hopper plates ready for cutting. **Rear Right:** Shaped sill hood plates; **Rear left:** cross ridge sheets ready for cutting.

• • •





CUTTING edge of cross ridge plate; use of hand toggle clamp is shown.

time and cost factors. With a number of different sheet sizes and with variations in the lengths of cuts to form the various parts, it was found most economical to load 12 sheets in order that the loading gang could load progressively ahead of the cutting operation with no delay of the cutting.

Jigs Filled Progressively

Material is loaded progressively, that is, the jigs are filled starting at one end of the machine and proceeding to the jig at the opposite end. The loading of the jigs continues, as does the unloading of them, while the cutting operation is being performed and the entire operation becomes a complete cycle of loading, cutting and unloading. As soon as possible, the cut stacks are separated by the same labor gang to make certain that there is no adhesion between the cut sections so that they can be easily handled through the subsequent fabricating operations.

It might appear that due to the

heat of the cutting reaction the edges of the sheets might become fused together. This action, it may be assured, does not occur under any condition. With certain improvements which have been made in cutting nozzle performance the operation of separating the cut sheets has nearly resolved itself into one of inspection in which it is only necessary to slide the sheets

apart to make certain there is no adherence.

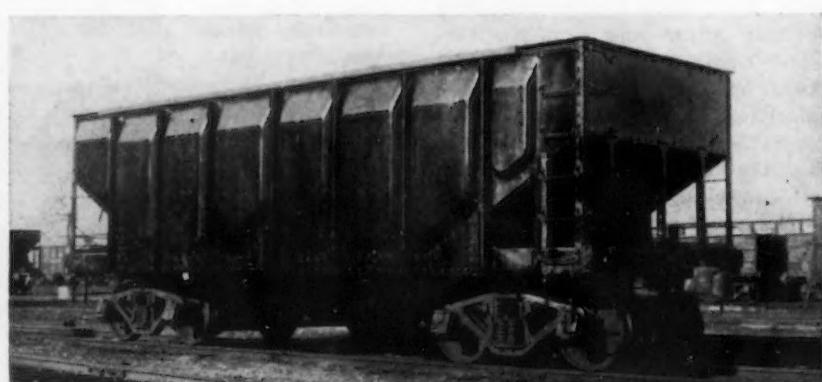
To assure close contact between the sheets, pneumatic clamping devices designed so that pressure can be applied quickly along the line of cut have been installed. The pressure is applied through levers moved by fulcrum bars extending along the sides of the work supports. The prime movers are 10 x 12 in. brake cylinders operated from the shop compressed air supply with a pressure of 90 lb. per sq. in. The pressure levers or bars are designed so that they can be easily removed to permit unloading and loading. The labor of removing and applying them is performed by the labor gang.

The operator inspects the stack to assure himself that the preparatory work has been properly performed and a good cut will result, after which, he applies the clamping pressure.

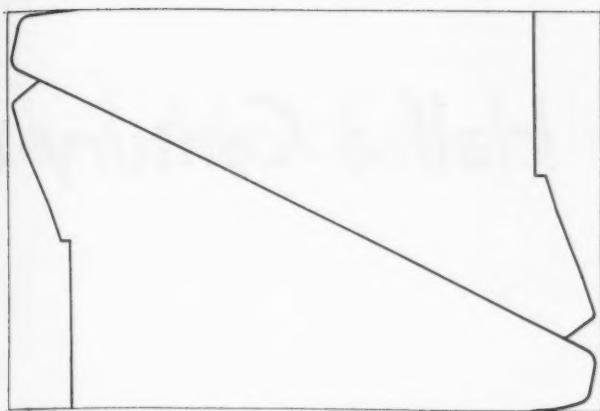
Flame Cutting Operation

The cutting operation is started immediately after the clamping, one operator handling the machine. The driving mechanism is controlled from the blowpipe end of the machine through a lifting and revolving device. The feed or cutting speed is regulated at the motor through a governor setting, but as a constant speed is used for the 3-in. stacks, very little regulation of motor speed is required. With the lifting device the machine can be moved from template to template from the front or blowpipe end of the machine.

Cutting is started at the edge of the stack against the gaging stops and, if continuous, is not interrupted until the cut is completed. In cases where the lines of cut inter-

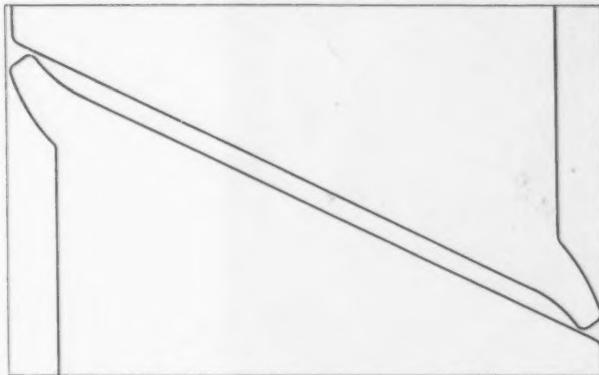


REBUILT self-cleaning hopper car. Accuracy of shape cutting is such as to permit the pressed plates to be placed easily into exact position.



OUTSIDE hopper sheet. Plate stock: $\frac{1}{4} \times 58\frac{1}{4} \times 76$ in.; total length of cut to make two pieces, 219 in.

IN SIDE hopper sheet. Plate stock: $\frac{1}{4} \times 37 \times 60$ in.; total length of cut to make two pieces, 208 in.



sect and stop at the point of intersection, gates or switches are provided in the templates; and when the cut reaches the point of intersection the cut is stopped until the gate can be moved into the proper position. The cut is then resumed by starting through the kerf at the point of intersection of the two lines of cut.

Machine speed is regulated to give a smooth cut with the greatest economy. In determining the proper size of stack to be used to obtain the best and most economical results a great deal of study was devoted to the size of nozzle, oxygen operating pressure and speed of cut, as well as to the loading factor. It was found that greatest economy could be obtained with a $12\frac{1}{4}$ in. plate stack, which permitted using a medium size cutting nozzle at nearly top speed for this thickness of material.

The results obtained through the use of the oxy-acetylene cutting process in stack cutting of freight car parts have fully met the expectations. Cost records, carefully made since the cutting machine has entered into full production, show an average saving over a

14-day period of 16 per cent in the direct cost as against doing this work by shearing methods. This comparison does not consider any factors of overhead such as maintenance of shearing machines and blades nor power costs, nor does it include the saving effected by reducing the many handlings of this class of material which are required with shearing.

Savings Obtained By Recovery of Usable Material

Another important factor is the large savings obtained from the recovery of new usable material. With shearing and coping methods it is not possible to recover much of the offal removed from the sheets in pieces large enough for use in the manufacture of the smaller parts required in car construction. This is particularly true where recesses are sheared by means of a coping shear. The material removed from recesses by the oxy-acetylene cutting process is in one piece and of

such size as can be used for the manufacture of other parts. It is not possible to set up an average figure to represent this saving, due to the variation in the work, but it is recorded that usable material to the value of nearly \$200 has been recovered during a six-day work period at our shop.

When the sheets are cut in stacks by the cutting machine, every piece is identical in contour and this contour can be duplicated over and over. The edges of the oxy-acetylene cut sheets are square and full, with no burrs or slivers. There is a total absence of tearing when the oxy-acetylene stack cut sheets are formed, due to the fact, that the cutting operation does not leave any sharp corners which have high stress concentrations and yield under the additional bending stress of the pressing dies. The radii left at such locations in the sheet contour tend to strengthen this section and provide additional material for the drawing action of the die.

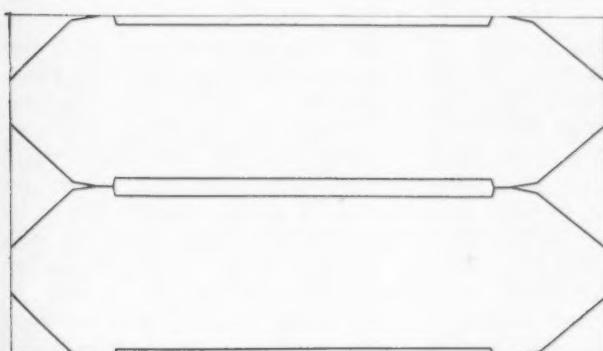
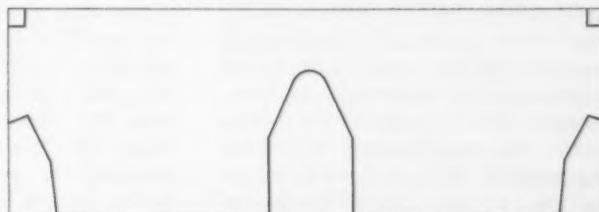
AT LEFT

LONGITUDINAL sill hoods. Plate stock: $\frac{1}{4} \times 58\frac{1}{2} \times 103\frac{1}{2}$, total length of cut to make two pieces, 451 in.

o o o

BELow

CROSS ridge (cross hood). Plate stock: $\frac{1}{4} \times 37 \times 118\frac{3}{4}$ in.; total length of cut to make one piece, 119 in.





HENRY SEARS HOYT

Half a Century of

MOST of us think of "specialization" as denoting a modern principle in organization. It is not as new as many suppose. In the field of steel merchandising, for example, A. Milne & Co. have

FIFTY years ago the American wire industry was beginning to spread its products over the earth in the form of wire fences, screws, wire bale ties, staples, wire rope, nails, springs and innumerable other wire products. This universal demand for American steel wire and the wide diversity of uses to which it was put created a proportionate demand on the part of American wire manufacturers for wire rods. Since the steel industry of this country could not at that time supply the finer grades of wire rods, manufacturers were obliged to secure this material from Sweden.

This was an ideal setting for the establishment of an American steel merchandising concern which had the necessary connections abroad and the requisite technical knowledge of American requirements. And Alexander Milne had both. He had entered the steel business in 1852 at the age of 20 in the Vickers Steel Works in

Sheffield, England. There he served his apprenticeship, later traveling through the whole of Europe selling Vickers steel until coming to this country to join the firm of Naylor & Co.

While situated in Boston on this company's business, Mr. Milne became acquainted with Luther Little, who at that time was also a salesman for Naylor & Co. in their Boston branch. These two men became firm friends and in 1887 decided to strike out for themselves and establish a steel merchandising business. As a result, the firm of A. Milne & Co. was founded on Jan. 1, 1887, offices being opened simultaneously in New York by Mr. Milne and in Boston by Mr. Little.

The firm received its first order on the following day. This order called for 500 tons of Swedish wire rods and was secured by Mr. Little from Mr. Moen of the Washburn-Moen Co., Worcester, Mass. This company is now the Worcester works of the American Steel &

Wire Co. In securing this order, Mr. Little promised Mr. Moen that he would have the 500 tons of Swedish wire rods on the dock at Boston within 15 days. Mr. Moen surmised that the new firm was promising the moon to secure its first order. Nevertheless the goods arrived in Boston on time. It seems that Mr. Little had been aware of the fact that a suitable parcel of the proper quality was at seaport in Hull, England, with an available steamer ready to sail in two days!

In 1890, more than two-thirds of the tack industry was controlled by Massachusetts, and fully three-quarters of it by New England. At that time A. Milne & Co. imported Swedish iron slabs which were rolled into tack plates for New England manufacturers to convert into tacks. Later, in 1892, the firm began to deal in English and German soft steel blooms. At this time, England and Germany had developed the Siemens-Martin

Steel Merchandising

just completed fifty years of specialized sales work. Founded in 1887, this concern has grown slowly but steadily to its present position as an important factor in the field of steel distribution.



J. KING HOYT, JR.

or open-hearth process to a much greater extent than had been done in this country. A ready market was found here for this material by the new firm and large quantities were imported and sold.

It was during 1892 that James K. Hoyt came into the firm as a junior partner stationed in the New York office. Mr. Hoyt had previously been employed by several New York iron and steel importers, among these Jere Abbott & Co., where he worked directly under the sales management of Austin A. Wheelock, who later became one of the founders of the well-known Wheelock-Lovejoy Steel Co.

In 1912, A. Milne & Co. decided to enter the hollow mining drill steel business and built a warehouse on Washington Street in New York, which is still occupied by the firm. From hollow mining drill steel to solid mining drill steel, and then to tool steel were all logical steps which followed in rapid succession. As the firm's

business increased, it was found advisable to secure representation in the Chicago area and a Chicago office was therefore opened in 1912.

After Mr. Milne's death in 1915, the partnership, under the same name, was continued by Messrs. Little and Hoyt. In 1916, Henry Sears Hoyt, now one of the two partners, entered the employment of the firm as stock clerk. Previously, after graduation from Harvard University and metallurgical studies at the Technische Hochschule in Charlottenburg, Germany, and at the University of Zurich, he had five years of association with the National Tube Co., three of these years in the metallurgical department under the supervision of Dr. F. N. Speller.

In 1919, a younger brother, J. King Hoyt, Jr., entered the A. Milne & Co.'s organization in the capacity of stock clerk in the New York warehouse. After serving in this capacity, he began selling iron and steel throughout Eastern

United States, Canada and Mexico. J. King Hoyt, who is the second partner in the present company, also received his formal education at Harvard University and like his brother, served with the American forces during the World War.

In 1926, H. S. Hoyt and J. King Hoyt, Jr., were brought into the partnership. In the same year occurred the death of James K. Hoyt and the retirement of Luther Little. The membership of the firm has since remained in the hands of H. S. Hoyt and J. King Hoyt, Jr.

In 1928, the firm secured the United States agency for S. & C. Wardlows, Ltd., maker of file and cutlery steel. In 1928, A. Milne & Co. acquired the Edgar Allen Steel Co., Inc., which had the American agency for all tool steels manufactured by Edgar Allen & Co., Ltd., Sheffield. The most recent expansion of the company has been the establishing of the Pittsburgh branch in 1936.

Cameron Defends the Machine

THE accompanying article is condensed from a talk given by W. J. Cameron, of the Ford Motor Co., before the Detroit Chapter, American Society of Tool Engineers, on Jan. 14. Mr. Cameron's philosophic defense of machine tools and mass production methods is a challenge to those unthinking sociologists who would rule out further development along these lines.

• • •



YOU might say that for two thousand years men's admiration was challenged by the work of their hands, using common tools known to man for ages. Now it is the tools that men use which vie with the work he does for our common admiration. Not what he creates, but the processes and the power of his creative act.

As man rises you can measure his rise by the tools he uses. As man rises his tools become more numerous, more diverse, and more complex. We are becoming conscious of that complexity today and we measure our progress in terms of the complexities of these things. The genius of highly skilled artisans requires more and finer tools. But here is the point that seems to me to clothe the whole philosophy of progress: that as the man who does things freezes and fixes some of his genius into a certain shape

of tool or into a certain kind of tool, he thereby makes it possible to transfer part of his genius by means of the tool to all who use it after him. Much of the skill that men possess today has been transmitted that way, in the fixed things that someone first developed for his own use and passed on to his sons or those who followed. Whereas he could do one thing at a time in former years, he now does twenty and forty things at a time. He has machines that can listen for him and hear for him and report sounds for him. He has machines that can see for him. He has machines that can count for him. He has machines that can judge and choose or reject for him. He has machines that bring a summer climate in the depth of winter or bring the coolness of autumn in the heat of summer into his homes and buildings. All these are the product of multitudes of minds concentrated upon this new, great, modern development, the tool. Commonplace ideas grabbed out of the atmosphere of the mind by countless engineers.

It seems almost sacrilegious to some to speak of beauty in connection with machines. Beautiful machines! But there is one mystery of the machine tool that always fascinates me, and that is its constant tendency toward beauty as it tends more and more toward efficiency. The more a machine fills its purposed use the more beautiful and symmetrical its design becomes. When you see an ugly machine you can almost put it down as a certainty that it is an unperfect machine. That it is overweighted. That it is over-noisy. That it is awkward. That it is not

doing its job in the best way. And as it becomes perfected and does its work in a better manner it begins to take on lines of character as a man devoted to his work and mastering it begins to take on lines of character in his face. And you begin to have a respect for the machine. It stands for an idea.

Now I think that all of us are conscious today that when we work with tools, we are creating more with them than merely the commodities we make with them. We are creating more with the tools we invent than anything we turn out with them. . . . But we are making new social conditions. And with that we are making new social problems. There can be no doubt to begin with—and this is the basic line that we always must throw down in any such discussion—that we are serving human life. We are at least doing that. The economic objectives of humanity haven't changed at all. Food and clothing, housing and transportation, agriculture, the supply of family life and reaching toward some form of social security, if there is any such thing on this planet—these have always been the same. But the conditions and the burdens of obtaining these common things have changed. Work is lighter, burdens have been lifted off flesh and blood and laid upon steel and iron. You men are constantly doing that. The time consumed is less. Our forefathers worked 12 or 15 hours a day. Our leisure is greater. Leisure is now an economic factor. We find now that men making things must have leisure in which to use them, that you can never build up a country like ours by keeping men at

(CONTINUED ON PAGE 119)

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

THE ECONOMICS OF INDUSTRIAL POWER TRANSMISSION

THE GOLDEN MEAN. This is the fourth chapter of a series which started Nov. 19, 1936 and continued through the issues of Dec. 17 and Dec. 31, 1936.



IN the course of a recent field trip through the Middle West two striking divergences of opinion were observed regarding the adaptability of different methods of driving automatic screw machines. Without going into too much detail and thus revealing the identities of the plants in question, it may be said that an identical drive problem has been treated in two plants in two ways, each diametrically opposed to the other.

The problem was that of applying power to a battery of automatic screw machines, 18 in one plant, 16 in the other. In both plants these machines performed operations practically identical; each machine working all day long on the production of a single item. The operating loads were as alike as two peas, in both plants, insofar as these batteries of machines were concerned. Output, in both cases, was approximately equal. Costs, likewise, were presumably not unlike, for both plants are very ably engineered and every attention is paid to the matter of keep-

ing production costs at a minimum in each plant.

Yet, in the one case, the 18 automatic screw machines were changed over a few years ago from old-fashioned lineshaft drive to individual motor drive, as part of a program of plant modernization which eliminated in wholesale fashion the use of belting and overhead shafting, improved lighting conditions materially, reduced safety hazards, reorganized materials handling methods and stepped up the flow of production generally. In the other case the 16 machines were changed over about the same time from old-fashioned lineshaft drive to modern group drive. Two uniform production units were formed, of eight machines each. In each unit a ceiling-mounted motor now drives a short, light-weight groupshaft suspended in hangers equipped with anti-friction bearings. From the shafts, flat belts drive each machine, with approximately one-sixth turn in each belt because of the angular placement of the machines with respect to the line of the shafting. At each machine light metal belt-guards ex-

tend upward to a point about 6 ft. from the floor level to eliminate flying belt hazards. Lighting conditions are excellent, and due to a revamping of the materials handling system and a study of economy of motion on the part of the machine attendants, production was stepped up materially.

Here is something which, on the surface, appears to be inconsistent. Can it be possible that two so-different methods of drive will really give equal results, claims and counterclaims of opposing camps of transmission experts to the contrary notwithstanding? But this is nothing more nor less than may be found in hundreds of cases all over the country. Just such comparisons are today being made in plant after plant, and on the basis of such comparisons opinions are expressed by plant operating executives determinedly, vociferously and even violently, in favor of one system of drive or another.

A Fallacious Comparison

The foregoing has been presented in detail because, surprising as it may seem, it is the sort of com-

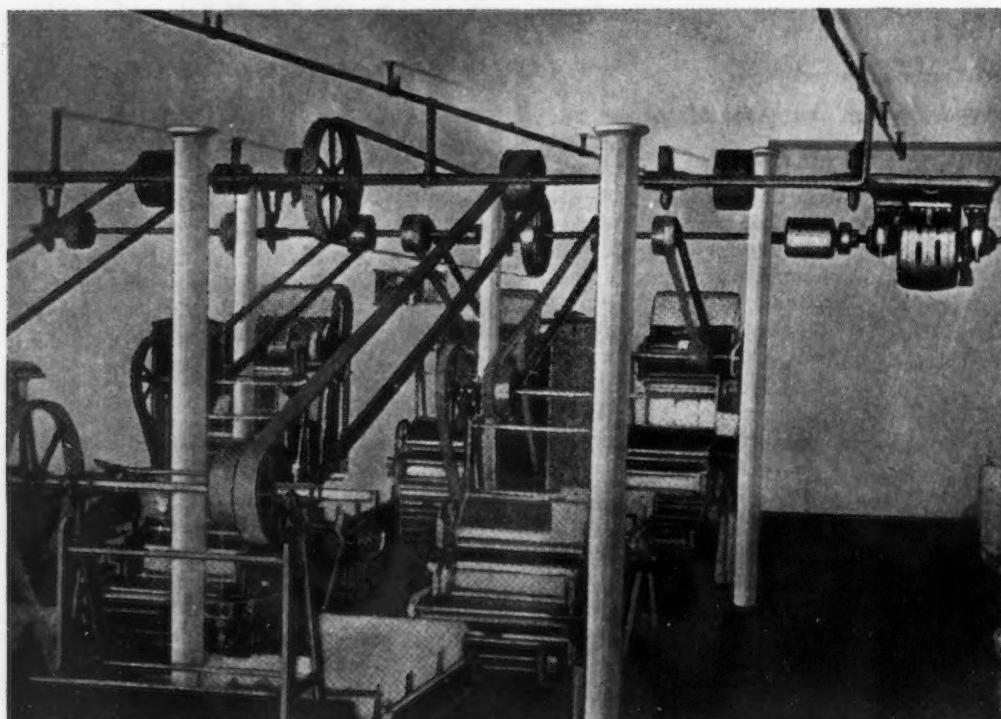
parison that is most commonly made. Yet, as a comparison of the relative merits of two different drive systems, it is utterly fallacious and is typically representative of the sort of argument which has produced so much of the hysterical partisanship for and against this or that method of transmission among hundreds of otherwise capable, experienced and qualified production executives. I do not exaggerate, for I have talked with many men who have decided a drive problem on as little evidence as I have indicated. Nowhere, in either case cited, do the fundamental economics of the situation appear to have been the deciding

the man responsible for the group drive set-up that he could have done better with unit drive. For both are right—on the basis of the incomplete evidence.

There are times when the arguments one listens to on this matter of applying power to machines come perilously close to the metaphysical disputes which filled the Middle Ages about the number of angels who can dance on the point of a pin. We have outgrown such foolish notions, happily. In their place we consider such essentially practical things as how to make a pound of coal, a gallon of oil, a kilowatt of electricity yield to us its last iota of usefulness. By

still tax ourselves to the tune of half a billion dollars a year because we do not use the most efficient means available of driving our machines. Fundamentally the problem is one of economics, not of opinion. Opinions are open to argument; economics are matters of demonstrable fact. There is one best way of applying power to any machine; economics will prove it, and at the same time demonstrate the error of other ways.

There are today only two valid systems of transmitting power to machines; the individual motor drive system, and the modern group drive system. Within each system there are countless varia-



A CEILING mounted 65 hp. induction motor drives six pickers in a Southern cotton mill. Four machines are driven from the main shaft, two from a counter shaft. These pickers would require at least 15 hp. motors each if equipped for individual motor drive.

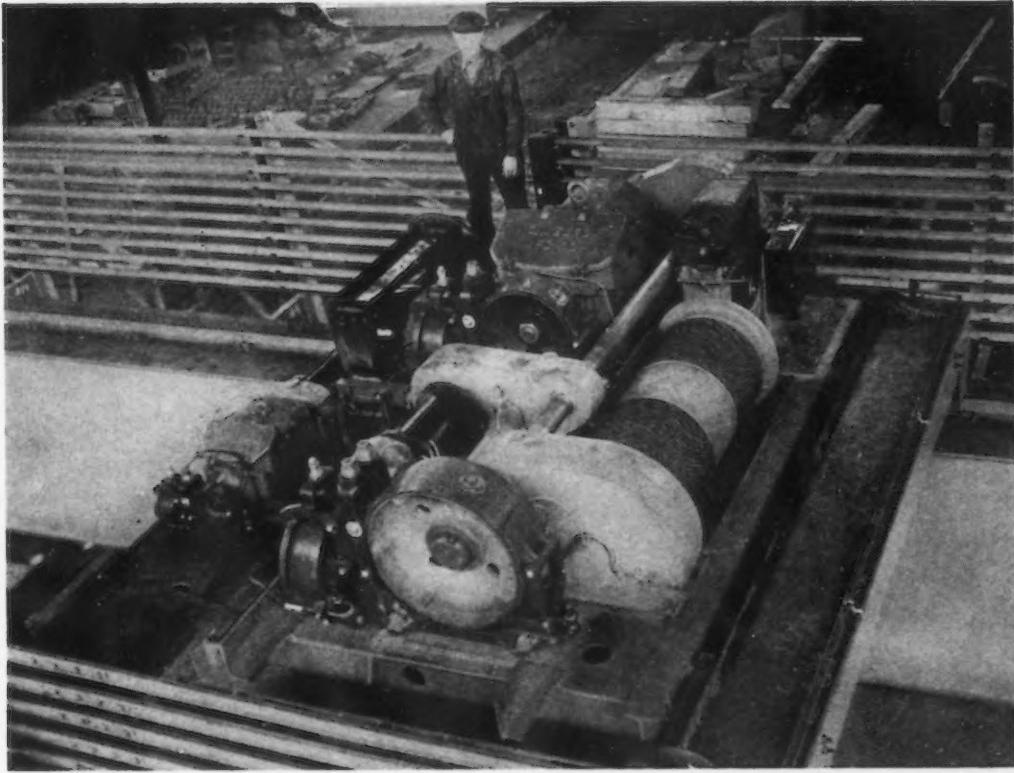
factor which has influenced the choice of individual motor drive on the one hand, or modern group drive on the other. Someone caught the idea of "modernizing" drives by using individual motors in the first plant; someone experimented successfully with modern group drive principles in the second. That the end result was approximately the same in both instances was a lucky chance; modern industry, however, is seldom profitably operated on lucky chances. And the unfortunate part of the situation is that, putting both cases together, you could never convince the man responsible for the individual drive set-up that he could have done better with modern group drive, or

constantly chipping off a corner of wasted effort here and there we gain greater efficiency, until, within the space of a generation, we learn how to produce a kilowatt of electricity from $\frac{1}{4}$ of a pound of coal instead of six to seven pounds; we learn how to reduce 31 haphazard motions of a machine operator to 11 perfectly timed and coordinated progressive steps, and thus speed up our production; and we substitute mechanical handling equipment for the unintelligent use of human muscle, and thus halve the costs of manufacturing. Yet in applying the power we are at such pains to produce economically to turn the machines of production, we

tions of the details of making the actual connection. In the preceding article of this series, entitled "How Many Machines to Each Motor?" certain categories of machines were indicated as being best adapted to individual motor drive. The rough general conclusion was drawn that all other industrial machines were adapted to either system. In this great middle ground, comprising well over 50 per cent of all drive applications, are to be found most of the batteries of production machines used in mass production manufacturing—and it is in this middle ground that the clearest thinking is needed, for it is here that most of the present huge wastes of industrial

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TYPICAL of a class of equipment for which only individual motor drive is adapted is this plant traveling crane. It is powered by husky Crocker - Wheeler Electric Mfg. Co. d. c. series wound motors, capable of wide speed regulation and particularly adapted for frequent and heavy starting loads.

• • •



power transmission are to be found.

Economics Provides the Solution

In a recent article entitled "Planning Power Transmission Efficiency," J. Decker, of the RKO-Victor Co., dwells at length on the fact that, although a great deal of thought is expended in most industrial plants on the introduction of new methods, machines and equipment for the purpose of reducing the unit costs of manufac-

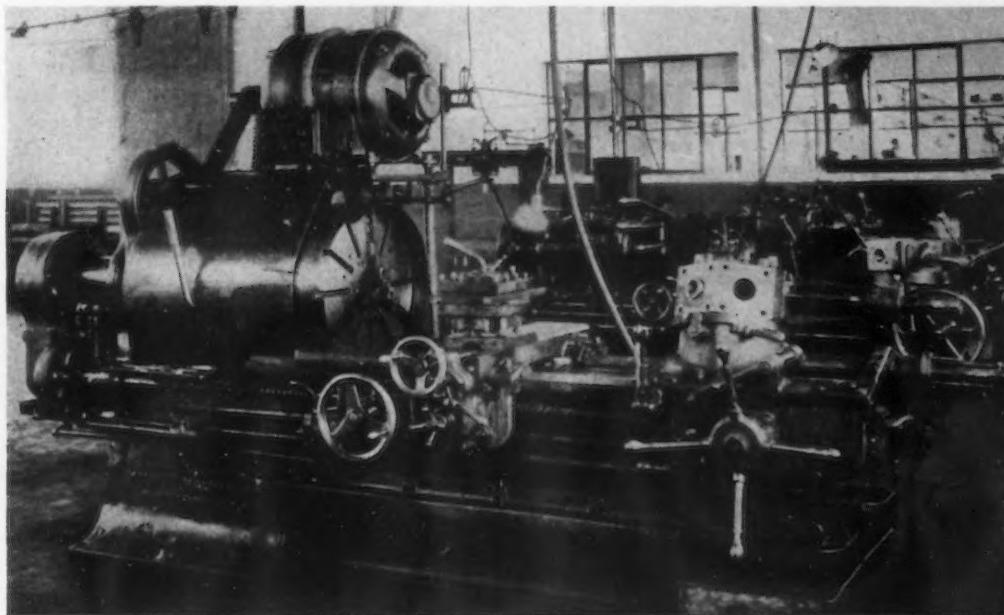
turing goods, comparatively little thought is given to the equally important matter of applying power to make those new methods, machines and equipment work most effectively. He says, "... for economical production the machine is held as the part most responsible. Everyone thinks firstly in terms of modern and efficient machinery and equipment, and secondly, if at all seriously, of mechanical power transmission. This is natural, and the order should not be reversed,

but as an object in effecting savings and obtaining maximum efficiency, the drive should receive equal attention, be it group or individual." This is a clear expression of the need; in applying it we must look at both the machine and the drive.

To do so from the standpoint of economics it is advisable to chart the study in a series of progressive steps, all basically related to the actual problem of production. First, as regards the machine (and

• • •
A LINCOLN ELECTRIC CO. 10 hp. constant horsepower a.c. motor drives this Gisholt heavy duty turret lathe by means of a flexible chain drive. Four motor speeds are provided, 1800, 1200, 900 and 600 r.p.m. As a single production unit, with highly individual operating characteristics, unit drive is clearly indicated.

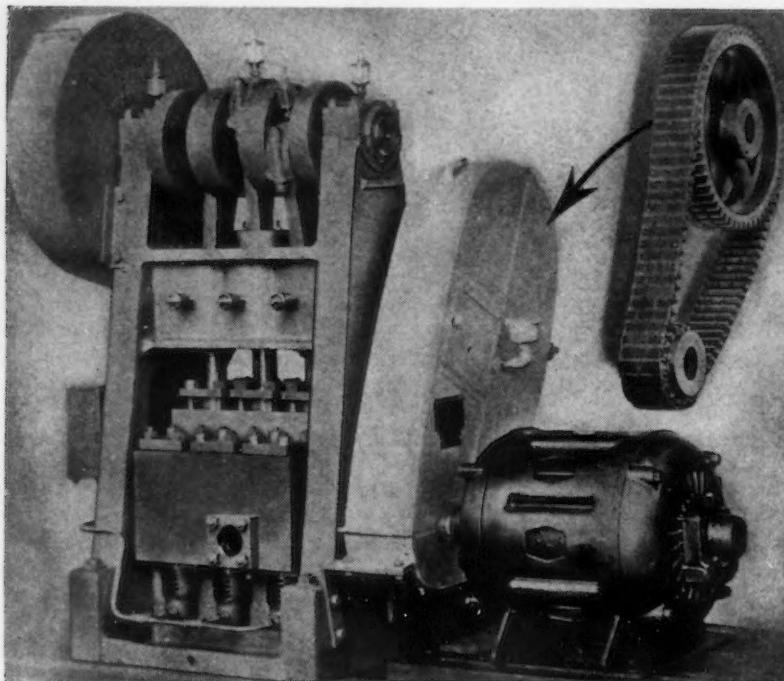
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at this point it should be made clear that, wherever possible, not a single machine, but a logical production unit of machines taken together ought always to be considered as the "machine" in question, until or unless it can be indubitably established that a single machine is the logical production unit) the points to be considered are:

1. *How nearly can the actual full capacity of the machine be*

speed for which the machine is best adapted, by improper regulation of the feed of the material to the machine, by not using the machine best adapted to the material being worked upon, or by an improper sequence of operations on the part of the machine attendant. Low utilization factor may be caused by difficulties in the operation or control of the machine, by improper location of the machine with respect to the flow of production, by



THIS triplex hydraulic pump presents a tough drive problem. The capacity is 36 gal. per min. working against a pressure of 1,000 lbs. per sq. in. It is driven, through a chain belt and heavy gears, by a Wagner Electric Corp. 25 hp. high torque, polyphase squirrel cage induction motor.

utilized? This involves consideration not only of the relation of the average load actually imposed on the machine to the full capacity of it (which relation may be termed "load factor"), but also the relation of the actual amount of time the machine is in use during an average working day to the total available time during that day in which it is possible to use the machine (which relation may be termed "utilization factor"). The arithmetical product obtained by multiplying load factor and utilization factor together expresses the degree of machine efficiency.

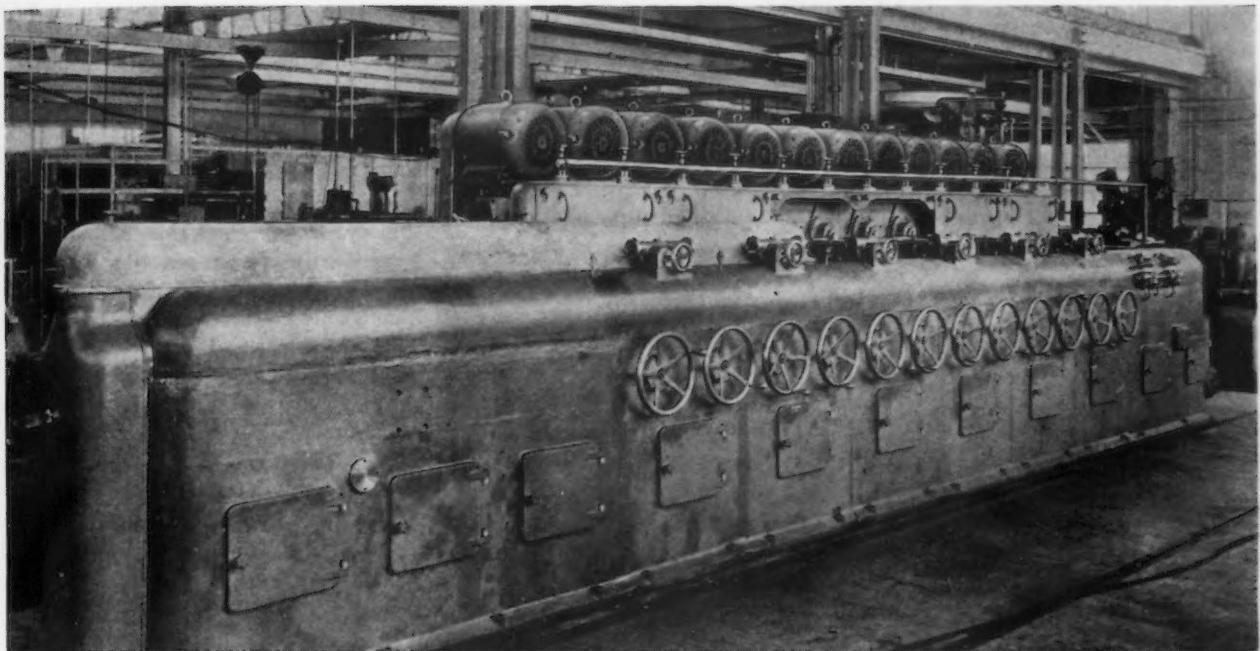
If it is found that the machine efficiency, as thus determined, is low, efforts should be made to correct it by studying the operations under two heads. Low load factor may be caused by not using the

a lack of motion economy of the machine attendant due to not having made a time study of his efforts to determine the best possible way of feeding to and removing from the machine the material being worked, to the employment of an attendant not suited for the job, or to faulty machine fixtures or drive equipment. Study of these items will invariably bring to light ways and means of increasing the efficiency of the machine itself, by showing how the load factor can be increased to use a larger part of the machine's capacity to do work, and by showing how the utilization factor can be increased to keep the machine performing useful work during a greater part of the working day.

2. *How effectively may power be applied to make the machine oper-*

ate? Having determined all possible ways of keeping the machine on an operating schedule of high efficiency, the next step is to determine how best to apply power to that machine to cause it to operate smoothly, steadily and continuously at the lowest cost for the power applied. This involves a study of the amount of power required for starting and peak load demands, as well as for normal running, the friction losses both in the machine and in the various drive methods considered, the flexibility of control demanded by the nature of the machine operations, the power factor of operation, and the investment and maintenance costs of the various drives considered. The ultimate decision as to the right drive for the machine in question thus comes down to a matter of costs; not only the first cost and carrying charges of the equipment to be used, but also the costs of using that equipment, in relation to the effectiveness of the operations performed by the machine.

Determination of the actual power requirements of any machine or group of machines should be made by test. Most equipment manufacturers rate the motor requirements of their machines too high, in order to be on the safe side. Most machines which must be operated at low load factor and low utilization factor are therefore grossly over-motored. For all such cases it should be borne in mind that modern motors are perfectly suitable for drives which require their operation at at least 25 per cent overloads for periods up to about 2 hr., and for at least 50 per cent overload for periods up to a quarter to a half hour. Let the overload characteristic, as defined by the motor manufacturer himself, take care of the maximum load requirements, providing always that average load requirements do not exceed the actual motor rating. Group drive tests for the determination of power requirements should be conducted over a period at least long enough to cover several complete cycles of machine operation, to insure the obtaining of readings which will include the maximum power demand occasioned by a majority of the machines falling into step. The selection of a motor to drive a machine, or a group of machines, of such rating that it will be operated most of the time at close to full



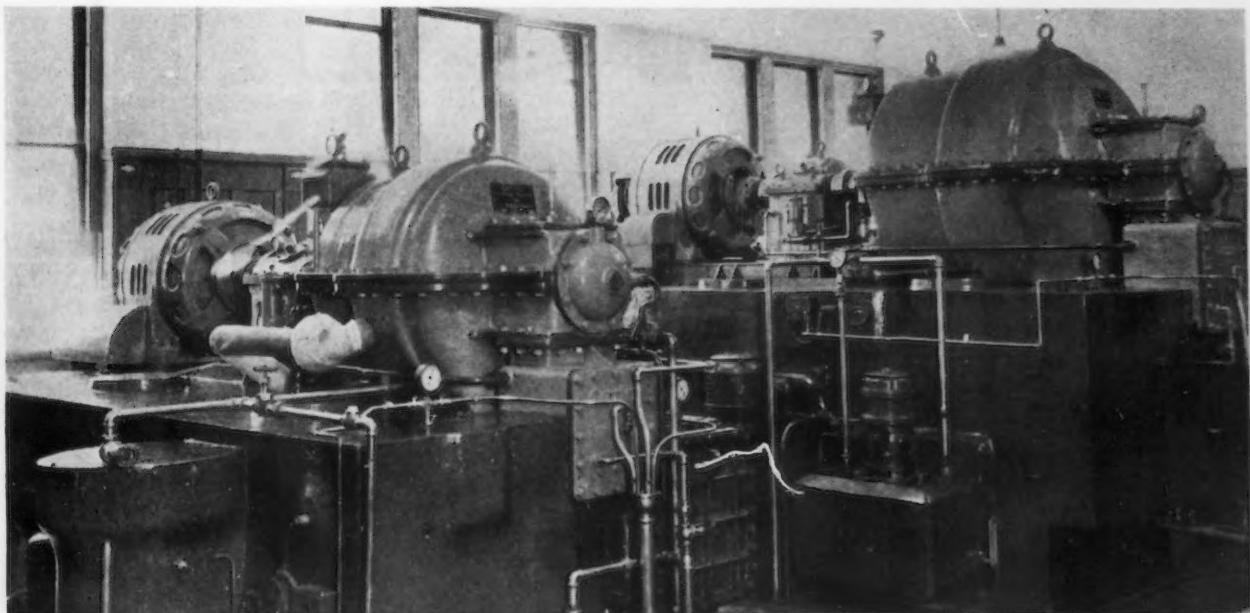
MANY special production machines must be multi-motored. This unusual piece of equipment was especially developed for an automotive manufacturer. It is entirely automatic, and is used for grinding brake shoes. Twelve Wagner Electric Corp. totally enclosed 220/440 volt a.c. motors furnish the power.

load rating, will result in more efficient motor operation, lowered power costs, high power factor, and decreased motor investment costs.

3. *What is the best arrangement for connecting the power to the machine?* This goes a step further than question No. 2. It gets into the problem of the actual mechanical connection, *after* the type of drive has been selected, and therefore requires an engineering

study of the equipment available to make that connection. That equipment may range from a shaft coupling in the case of a direct-connected motor, through gears, chains, belts and hydraulic drives to shafts and hangers, clutches, pulleys and all other mechanical transmission equipment. Involved in this study are the conditions of the nature of the load (steady, pulsating, widely fluctuating, shock, or reversing), foundations

of the machine and supports of fixtures, conditions of operation (as temperature, fumes, dirt, oil or moisture), maintenance (including lubrication, repairs and renewals of parts), and availability of spare parts in case of a breakdown. Through all this again runs the connecting thread of economics, for each item should be regarded not only from the engineering point of efficiently transmitting the power, but also from the eco-



UNITY power factor is achieved in driving these two compressors in a mid-Western brewery. (Compressor drives, incidentally, furnish many opportunities for the use of motors which will raise the average of plant power factor.) The motors here are Ideal Electric & Mfg. Co. 100 per cent power factor, a.c. slip-ring, capacitor motors of 125 hp. and 300 hp.

nomic point of its relation to the costs of manufacturing the product.

4. Finally comes the question, all too frequently disregarded until after the event, *What will the effect be with regard to safety, to the conditions of lighting, and to the general working conditions under which the machine operator*

dends both in increased output and lowered unit costs—and the best time to put it into effect is when planning the machine set-up and the power transmission layout. Later, it costs double.

The Golden Mean

A trenchant editorial in *Mill & Factory* recently included this

profits, volume production and safe working conditions are made ideally possible by the use of modern power control, distribution and transmission devices. As a consequence we find the product engineer, the time-study engineer, the maintenance engineer, the production manager and the foreman all primarily concerned with individual phases of power transmission, but collectively concerned with the effect of efficient power use upon wage rates, costs, profits, prices, and the quality and quantity of production."

Power transmission has become the hub of the wheel. But power transmission is fundamentally a matter of economics. A clear-cut determination of the economic values of all the factors of any power transmission problem inevitably results in the selection of the right drive for each machine. Opinions, set, preconceived, or founded upon a life-time of experience, may be valuable. Too often they are productive of plain hysteria because they are made after consideration of only part of the facts in the case—like most political oratory.

There is always a golden mean, a one best solution. Nine-tenths of all the differences of opinion in the world are caused by lack of exact definition of fundamental principles; by lack of understanding of exactly what the other fellow means. Two engineers will argue for hours on individual drive vs. group drive, when a determination of the basic economic factors of a particular case would settle the controversy in two minutes. Both methods cannot be right for all cases. Each has its place in the sun. No one can possibly say, off-hand, this method is best here, or that method there. Every case is a special problem affected by the nature of the operating conditions in the plant, by the type of work done, by the machine requirements, by the flow of production, and by many other factors. Investigate the economics of that problem, and these factors will fall into their proper relationships. The resulting solution of the problem will be a drive that is right, because it saves money. That is the golden mean to be sought for in every power transmission problem.



A UNIQUE drive arrangement, using chains. Five paint mixers receive batches from the floor above and are driven by silent chains from a lineshaft powered by a single 3 hp. squirrel cage motor. A separate clutch for each machine drive is mounted on the group shaft.

must live? For it cannot be denied that more work, at lower cost, can be obtained when working conditions are good, when sufficient light is available on the work, when hazardous elements are eliminated. This factor cannot be too highly stressed. Fortunately it has become an essential part of the creed of the modern manufacturer to provide the best possible working conditions for his operators. It is a creed that pays divi-

powerful statement: "The day has passed of forcing profits out of obsolete plant equipment by using speed-up systems for driving workers at a killing pace. Modernization of plant equipment has taken the place of these cruel systems of exploitation. The productivity of modern power has transferred the large opportunities for savings from the worker to the machine. Today, high wages, short hours, efficient production, high

Rust Proofing Iron and Steel

By Metallizing

METALLIZING, as an effective method of rust proofing iron and steel has recently been adopted by The Lathrop - Paulson Co., Chicago, manufacturer of milk can washing machinery and conveyors. The problem involved consists, first, of construction of a product which is subjected to conditions which promote rapid oxidation of ferrous metals, and secondly, the impracticable burden of expending the necessary money for a hot galvanizing department.

Previous to the installation of the metallizing equipment, fabricated parts were loaded into trucks and moved to a job galvanizing shop. In addition to the delay incurred incidental to trucking, there was also occasional damage to parts when loading and unloading for transport, as well as warpage resulting from the galvanizing temperatures. A damaged part when properly repaired often required a second trip to the galvanizing jobber, thereby adding delay to disrupted assembly schedules.

Further, parts that were galvanized by the old method needed cleaning, filing and touching up as well as hole reaming upon return to the shop. Another important consideration is that hot galvanizing provides a coating 0.003 in. thick whereas with metallizing and zinc wire a heavier coating can be applied, 0.006 in. now being the standard. This is important in the case at hand because many of the parts in the can washing machinery are not only subjected to corrosion but also to mechanical wear. Should a protective coating heavier than 0.006 in. be required on all parts, or on only a few parts, the desired metallized thickness can readily be had.

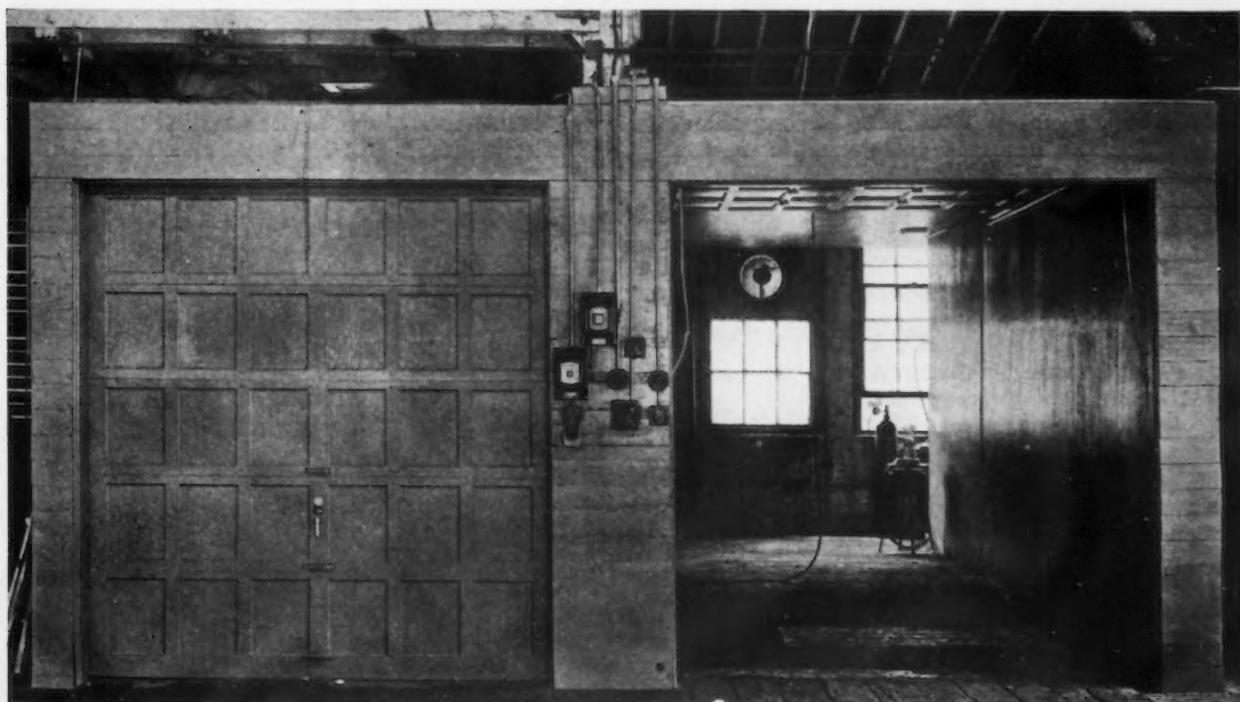
Metallizing offers several other advantages. Floor space required and cost of installation are low and it is adaptable to intermittent

operation without standby losses. Truck transportation and loading time is saved and a part damaged in the shop can be quickly put through the process should areas on it need a new protective coating. Cleaning and trimming are entirely eliminated and rubber plugs protect both plain and tapped holes so that they need not be reamed or traced to free them of spelter.

The equipment consists of two simply but sturdily constructed rooms divided by a center partition. Each room measures 10 ft. by 25 ft., the back walls being formed by an outside shop wall which provides window lighting and space for wall-type ventilating fans which draw air from the rooms. One room which is used for steel blasting is equipped with a Ruemelin Mfg. Co., Milwaukee, grit blasting unit and a sifter. This room is lined with blue annealed sheets which offer resistance against wall and ceiling wear resulting from the grit blast.

The metallizing room is lined

TWO rooms, each 10 by 25 ft., provide the space necessary for blasting and metallizing.



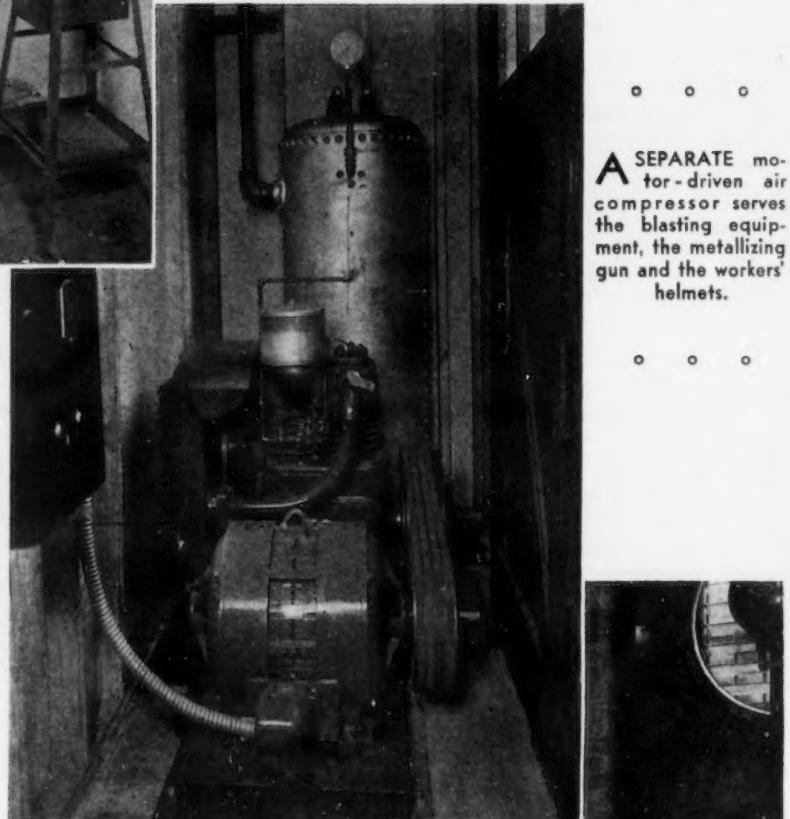


• • •
THE operator can rapidly apply a zinc coating with minimum loss of the coating metal.

• • •

Practice shows that the metallizing gun which was supplied by Metallizing Engineering Co., Chicago, coats almost as fast as a paint spray gun but with negligible loss of zinc. The sprayed metal effectively coats recesses and all irregular shapes. A can washing machine frame several feet wide, 20 ft. long, and consisting of steel angle and channel side and end

(CONTINUED ON PAGE 82)



• • •
A SEPARATE motor-driven air compressor serves the blasting equipment, the metallizing gun and the workers' helmets.

• • •

with plywood. Each room is fitted with tight overhead doors so that dust and odors cannot get into the main shop. Ceilings are 10 ft. high.

All parts to be metallized are first thoroughly blasted with No. 50 steel grit. Once a part is so cleaned it is moved without delay to the metallizing room, care being taken to keep all foreign matter from the cleaned surface. This point is important to the extent that in handling parts the workmen wear gloves to avoid the possibility of oil on or from the skin making spots on which the metallized zinc will not properly adhere.

A two-cylinder, 100 cu. ft., 80 lb. pressure, motor-driven air compressor, equipped with a Ruemelin air separator, furnishes air to the metallizing gun, the grit blasting units and to the helmets worn by the operators in the rooms. Air is forced into these helmets at low pressure thereby preventing inward leakage of harmful air and giving the workmen clean air to breathe.

The use of blasting was not new in this shop because for fast work coated welding rods were preferred. It was quickly learned that when coated rods were used the weld had to be blasted before it would take a satisfactory hot zinc coating. With the new arrangement all surfaces of a part are blasted before metallizing and therefore importance is no longer attached to the type of welding rod used except insofar as actual welding characteristics are concerned.

• • •
AT RIGHT
ALL parts to be zinc coated are thoroughly blasted with No. 50 steel grit.

• • •

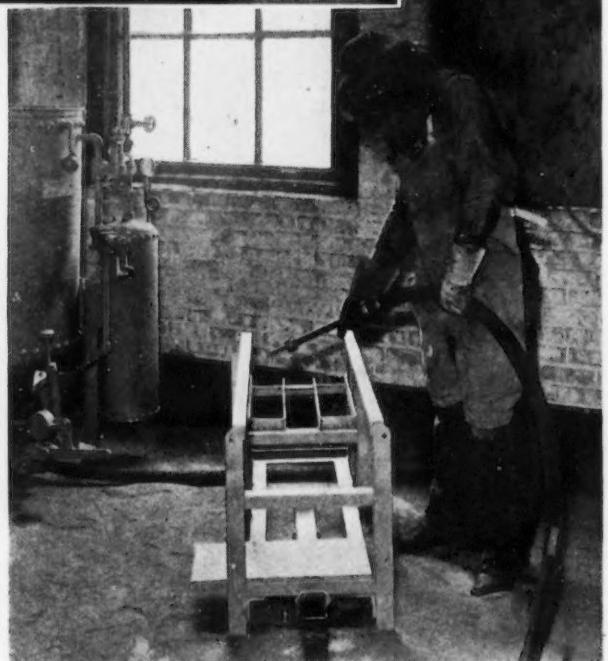




Photo by Alfred Cook

**Like jagged fangs projecting from the jaw
Of Cerberus, confined in Hades' maw,
These ghost-like, rotting spires jut stark and drear
As monuments to mark the passing year.**

**Such transitory signposts have their day—
Pass to oblivion, and resign their sway
To Progress, Science—to enduring Steel;
Their epitaph these sky-line spires reveal.**

**True, pristine glories win the world's acclaim
For one brief moment—then forego their fame;
But Steel, the child of Vulcan's mighty hand,
Is destined to survive—and to command.**

—J. M. M.

THIS WEEK ON THE ASSEMBLY LINE



... General Motors reiterates that it will never make exclusive bargaining agreement with John L. Lewis, although forced to bargain by Presidential command, prior to plant evacuation.

• • •

... Record shows that in all disputes to date UAW has yet to gain recognition as sole bargaining agency, although contracts have been signed giving proportional representation.

• • •

... Flint situation remains tense, while Governor Murphy withholds troops in backing up court action on sitdowners.

• • •

... Firestone joins Goodyear in acquiring property for Michigan plant, as Ford buys machinery and plans building for tire making.

As the conference between General Motors officials and the John L. Lewis group dragged on from day to day last week, rumors began flying thick and fast as to what might be the probable outcome. For a day at least, newspaper reports seemed to indicate that General Motors was ready to concede that the CIO and its affiliate the UAW would be recognized as the sole bargaining agency in

all of the 17 struck plants. Further credence was given this report by hourly announcements that a settlement was about to be effected. By Saturday, however, it was learned from high sources in General Motors that there was no truth in this rumor at all, which had apparently been started by the union group in order to bolster up its membership drive.

Late that evening Governor Mur-

phy confirmed the fact that the chief stumbling block to the negotiations was this point of sole recognition. General Motors has been holding out consistently that it would recognize the UAW as a bargaining agency for its members only, reserving the right to deal with other groups. Nearly all the other questions before the conference had been ironed out harmoniously, according to the governor.

General Motors Using Legal Tactics

In the meantime, General Motors has been pushing the battle on several legal fronts. Injunction proceedings were being pushed in Cleveland and plans were being made in Flint to have a similar injunction issued against the sitdowners in Chevrolet Plant No. 4 as has been issued against the strikers in the two Fisher Body plants. While the issue in the settlement between General Motors and the CIO is predominantly the factor of recognition of the UAW as the sole bargaining agency, the illegal occupation of the Flint plants is by far the greater issue as far as industry and the country as a whole is concerned. In Flint itself there is a feeling of utter demoralization when the ordinary citizenry see court orders flouted despite the presence of 4000 members of the National Guard. Even after General Motors had secured a writ which could be served on the persons of the sitdown strikers and the officers of the union, the sheriff failed to make the arrests because of a hold-up order on the part of Governor Murphy. Outwardly the reason given was possible violence that would inevitably follow forcible ejection and the



BY
**FRANK J.
OLIVER**
*Detroit Editor
THE IRON AGE*

hourly reports that the conference was about to be concluded in an acceptable settlement. The sheriff has laid the whole matter right in the Governor's lap and at this writing had made no attempt to swear in additional deputies to enforce the court order, nor has Governor Murphy seen fit to place at the sheriff's disposal the National Guard.

As a result, Flint continues to remain the powder keg it has been for the last few weeks. What particularly disturbs the outsider in Flint is the arrogance with which the striking element has practically taken over the patrolling of the main highway in front of Fisher No. 1 plant. Even the chief of police was challenged and threatened with violence by strikers armed with clubs.

While it is said that Governor Murphy has Presidential aspirations in 1940, it is apparent he is not going in with Calvin Coolidge's record in the Boston police strike. It is quite obvious, however, that he is taking his orders from Washington. It is equally apparent that Mr. Knudsen and other General Motors officials never would have sat in on a conference with Mr. Lewis and Mr. Martin, prior to evacuation of the plants, unless pressure had been put upon them by the White House. Through this pressure, the corporation has been forced to discuss practically the whole eight issues originally raised by the UAW and on which General Motors had refused to bargain collectively until the sitdowners were out of the plants. By forcing this conference, the President has tacitly condoned the sitdown strike as a legal weapon by permitting

Lewis to hold these plants in ransom while dickering on such vital questions as full recognition.

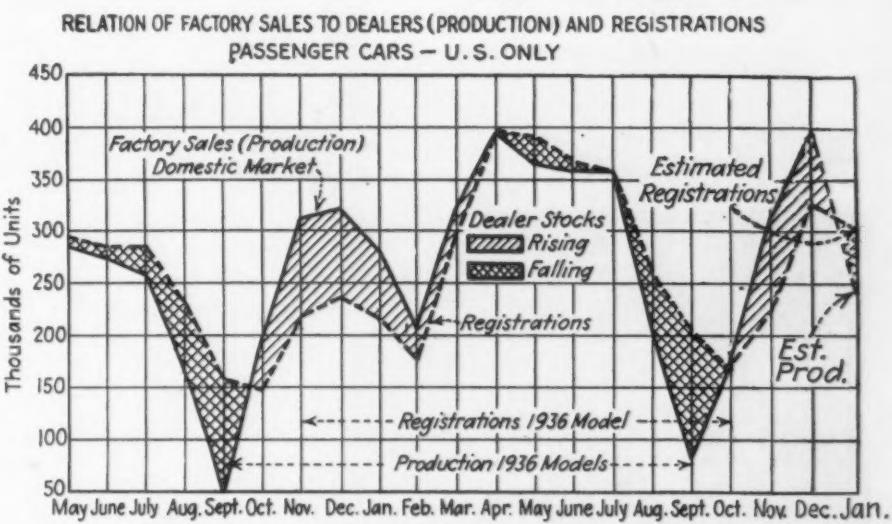
In all the labor disputes that have recently occurred in which the UAW and related unions have been involved, full recognition of the union as sole bargaining agency has not yet been gained, although in more than one instance contracts have been drawn up between the company involved and the particular local of the UAW.

Some optimists believe that there is always some good that can come out of any struggle between labor and industry. By appealing to the workers' self-interests, for example, the management of National Automotive Fibres, Inc., has been able to build up a better *esprit de corps* than it had before its brief struggle with the UAW in De-

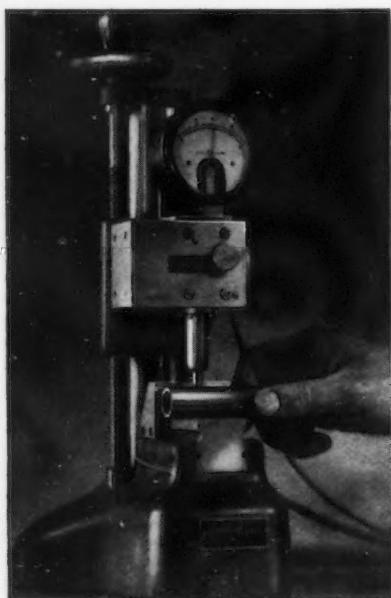
cember. Its experience points to a possible solution in the labor difficulties, since both the employees' council and the independent union have a voice in collective bargaining and everyone is happy.

National Automotive Fibres, Inc., by the way, operates in Detroit an unusual factory as far as Detroit industries go. It is a textile finishing mill in a metal-working center. Operating in one of the highest rate labor markets in the country, it pays wages far in excess of those textile mills in New England and in the South, the products of which it fashions into automobile seat covers. A relative newcomer to Detroit, it boasts factory buildings of the most modern type, well lighted, and providing the best of working conditions.

One thing should not be over-



PRATT & WHITNEY



Above: Electrolimit Gages check and grade wrist pins at 700 per hour.

Electrolimit Gage in the Automotive Industry

THIS most modern instrument for governing production accuracy has won its automotive spurs. In its various forms it has reduced costly inspection to a simple routine. But most of all, because it can sort parts with uncanny speed into accurately matched groups, it has reduced assembly time and troubles tremendously.

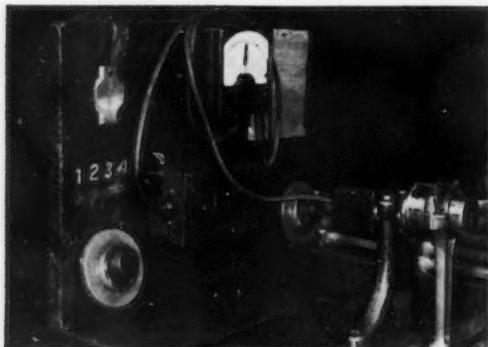
Pratt & Whitney Electrolimit gages will smooth out your gaging difficulties. They pay for themselves in short order by reducing costs—and then go right on producing dividends.

Let us give you the complete facts and figures.

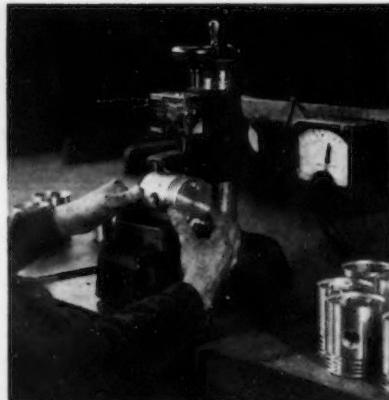
PRATT & WHITNEY DIV.

NILES - BEMENT - POND COMPANY

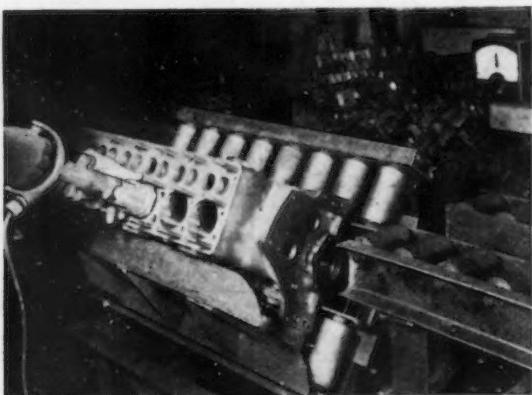
Hartford, Conn.



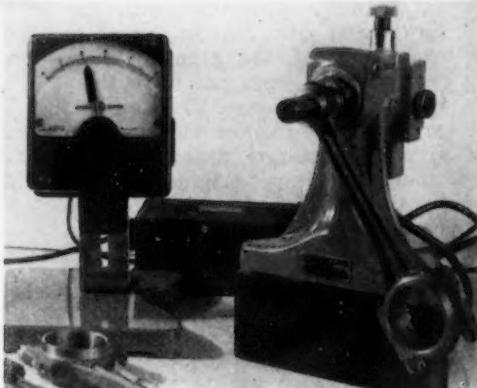
Electrolimit Internal Comparator gaging and grading for selective assembly the crankshaft bore of an automotive connecting rod.



Above: P&W Electrolimit Internal Comparator checking and grading the wrist pin hole in automotive pistons for selective assembly.



Above: Checking the outside diameter of automotive pistons and grading them for selective assembly, using the P&W Electrolimit Gage.



Right: Electrolimit Internal Gage checking and grading a connecting rod wrist pin hole.

looked in this present struggle in the automotive industry and that is that the history of industrial disputes shows that, as time drags on, the strength of the union increases in the way of membership. In fact, a strike is the fastest way of pulling in members. This was amply demonstrated about a month ago in a machinery and tool shop in Detroit employing 500 men. At the start of the strike, there were only 150 members in the union, but before a complete settlement was effected, practically 100 per cent of the shop was enrolled and a formal contract with the union was part of the settlement.

Last week the same group, Mechanics Educational Society of America, started a sit-down strike at the Kelvinator plant of the Nash-Kelvinator Corp. in Detroit. According to union officials the strike was called because the management thought the union was bluffing as to its strength. Suggestions of taking a poll either under official auspices or through an outside auditing bureau were turned down so the union took recourse to the strike weapon to prove its strength. Starting with an assumed membership of 900, the MESA now claims 1500 workers out of the 2500 in the plant. In this instance, incidentally, the issue is not one of recognition as the sole bargaining agency, but higher wages. The company points to its fine labor record and its average hourly rate of 80.4c. for all employees, approximately half of whom are women. The union claims, however, that this figure is arrived at simply by taking an arithmetical average of all the wage classifications and that a weighted average would be much lower.

The same group is also conducting a slow-down strike at the

Spicer Mfg. Co. plant in Toledo, where it is restricting output in order to enforce wage demands. A management offer of a 5c. an hr. increase has been turned down. In the meantime, in the Kelvinator strike both sides are standing pat, while a member of the National Labor Relations Board acts as unofficial mediator. The union appears to be in no hurry to make a settlement, since it claims its membership drive is being enhanced so greatly as to offset months and perhaps years of effort under more peaceful conditions.

The MESA has been fairly successful in settling disputes in some of the small jobbing tool shops in the city. As a result, they have raised the wage scale for skilled tool makers to a minimum of \$1.10 an hr. They seek a minimum of 75c. an hr. for men at Kelvinator and 65c. an hr. for women.

Settlement of the 56-day sit-down strike at the Hercules Motor Corp. plant at Canton, Ohio, points to a number of trends affecting settlements in which the CIO and UAW are involved. The Hercules strike had seriously affected production at the Twin Coach Co., Cleveland Tractor Co., Federal Truck Co., and the Diamond Truck Co., where in the aggregate 3700 workers were laid off because of lack of truck and bus engines. About 100 men held the plant during what is probably the longest sit-down on record. In the settlement, a contract was signed with the UAW calling for the recognition of this CIO union as a bargaining agency for its members, seniority rights, consideration of wage increases three months hence if business conditions warrant and possible adjustments in piece work rates. A 37½-hr. week was estab-

lished. The strikers had demanded recognition as sole bargaining agent and a blanket 22½ per cent increase in wages.

Production Continues Decline

Automobile production continued to show the effects of labor troubles in the industry last week. Output of cars and trucks in the United States and Canada continued its downward movement, as General Motors assemblies dropped from 6100 to 1500 for the week ended Feb. 6. Total assemblies for the week were 72,010, compared with 76,620 in the preceding week and 78,219 in the corresponding week last year, according to Ward's Automotive Reports. Ford showed an advance to 28,825, up 500 units from the week before, while Chrysler divisions held steadily at 25,350 units. Last year at this time assemblies declined drastically, owing to adverse weather conditions which not only curtailed new car sales, but also hampered the shipment of cars by haulaway and driveway.

As soon as a settlement is effected, General Motors assemblies should rise rapidly, as the corporation now has large banks of finished parts on hand and the various sales divisions report large backlog of orders. It is as yet too early to know what the effect of the floods may have been on automobile sales, although it is obvious they will be restricted in inundated centers.

Despite labor difficulties, the index of industrial employment in greater Detroit rose to 126.0 as of Feb. 1, and as compared with 114.4 on Jan. 15 and 103.8 a year ago. Average employment in the city during the entire month of January will probably run close to 12

(CONTINUED ON PAGE 88)

DESOTO's new chassis and final assembly lines are now rolling along at the rate of one completed assembly per minute. This view was taken in the modernized Wyoming Avenue plant, at one time occupied by General Motors for LaSalle production. Overhead conveyors and sub-assembly lines feed 3500 tons of material and sub-assemblies to the lines each day.



Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly
as More Recent Figures Are Made Available.

	January, 1937	December, 1936	January, 1936	Year, 1935	Year, 1936
Raw Materials:					
Lake ore consumption (gross tons) ^a	4,551,379	2,951,568	30,857,862	44,639,318	
Coke production (net tons) ^b	4,608,655	3,450,342	35,141,261	46,317,087	
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	*3,212,135	3,115,037	2,025,885	21,007,802	30,518,797
Pig iron output—daily (gross tons) ^c	*103,617	100,485	65,351	67,556	83,658
Castings:					
Malleable castings—production (net tons) ^d.....	.....	61,674	48,198	466,395	571,696
Malleable castings—orders (net tons) ^d.....	.....	67,035	43,852	452,611	576,334
Steel castings—production (net tons) ^d.....	.....	44,298	398,988	.....
Steel castings—orders (net tons) ^d.....	.....	59,019	400,157	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e.....	.....	4,431,645	3,045,946	33,417,985	46,919,362
Steel ingot production—daily (gross tons) ^e.....	.....	170,448	112,813	107,453	150,383
Steel ingot production—per cent of capacity ^e.....	.....	77.66	51.40	48.54	68.52
Finished Steel:					
Trackwork shipments (net tons) ^f.....	.....	5,579	3,366	42,229	68,813
Steel rail orders (gross tons) ^f	25,700	125,290	208,541	533,120	1,053,230
Sheet steel sales (net tons) ^f.....	.....	336,758	174,805	2,473,489	2,720,330
Sheet steel production (net tons) ^f.....	.....	230,581	223,000	2,424,990	2,598,140
Fabricated shape orders (net tons) ^f.....	.....	166,542	120,364	1,068,603	1,609,016
Fabricated shape shipments (net tons) ^f.....	.....	121,775	79,995	1,095,216	1,548,205
Fabricated plate orders (net tons) ^f.....	.....	51,017	38,709	258,315	484,038
Reinforcing bar awards (net tons) ^f	10,220	18,550	62,210	318,340	334,790
U. S. Steel Corp. shipments (tons) ^b.....	.....	1,067,365	721,414	7,371,299	10,825,132
Ohio River steel shipments (net tons) ⁱ.....	.....	111,450	65,760	926,174	1,169,321
Fabricated Products:					
Automobile production, U. S. and Canada ^k.....	.....	519,132	377,306	4,119,811	4,616,857
Construction contracts, 37 Eastern States ^l	\$199,695,700	\$204,792,800	\$1,844,544,900	\$2,675,296,000	
Steel barrel shipments (number) ^d	895,481	542,597	6,872,452	8,600,493	
Steel furniture shipments (dollars) ^d	\$2,112,972	\$1,586,446	\$15,523,679	\$19,245,935	
Steel boiler orders (sq. ft.) ^d	1,872,139	623,364	6,245,158	11,511,557	
Locomotive orders (number) ^m	46	14	83	.....
Freight car orders (number) ^m	10,881	1,050	18,699	.....
Machine tool index ⁿ.....	.....	257.7	110.8	+99.9	+180.4
Foundry equipment index ⁿ.....	.....	127.0	119.5	+119.5	+178.5
Foreign Trade:					
Total iron and steel imports (gross tons) ^p.....	.....	52,584	50,489	470,015	666,838
Imports of pig iron (gross tons) ^p.....	.....	10,423	15,036	130,937	165,909
Imports of all rolled steel (gross tons) ^p.....	.....	22,958	216,567	.....
Total iron and steel exports (gross tons) ^p.....	.....	244,156	241,564	3,063,605	3,162,694
Exports of all rolled steel (gross tons) ^p.....	.....	79,100	897,749	.....
Exports of finished steel (gross tons) ^p.....	.....	74,254	767,456	.....
Exports of scrap (gross tons) ^p.....	.....	109,026	153,906	2,103,959	1,941,031
British Production:					
British pig iron production (gross tons) ^r.....	.....	671,400	595,500	6,426,400	7,681,600
British steel ingot production (gross tons) ^r.....	.....	1,019,200	911,700	9,842,400	11,699,000
Non-Ferrous Metals:					
Lead production (net tons) ^s.....	.....	47,085	36,296	421,764	463,187
Lead shipments (net tons) ^s.....	.....	51,646	34,590	433,456	512,975
Zinc production (net tons) ^t	40,025	47,050	41,917	431,499	524,271
Zinc shipments (net tons) ^t	50,638	59,821	46,468	455,746	563,273
Deliveries of tin (gross tons) ^v	7,615	6,930	6,535	59,110	74,005

* Estimated. † Three months' average.

Source of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp.; ⁱ United States Engineer, Pittsburgh; ^j When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of Census; ^k F. W. Dodge Corp.; ^l Railway Age; ^m National Machine Tool Builders Association; ⁿ Foundry Equipment Manufacturers Association; ^o Department of Commerce; ^p British Iron and Steel Federation; ^q American Bureau of Metal Statistics; ^r American Zinc Institute, Inc.; ^s New York Commodity Exchange.



THE IRON AGE Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week	85.3	Same week 1933	34.7
Preceding week	*85.9	Same week 1932	42.2
Same week last month	95.0	Same week 1931	71.6
Same week 1936	74.3	Same week 1930	99.5
Same week 1935	65.3	Same week 1929	123.5
Same week 1934	57.5		

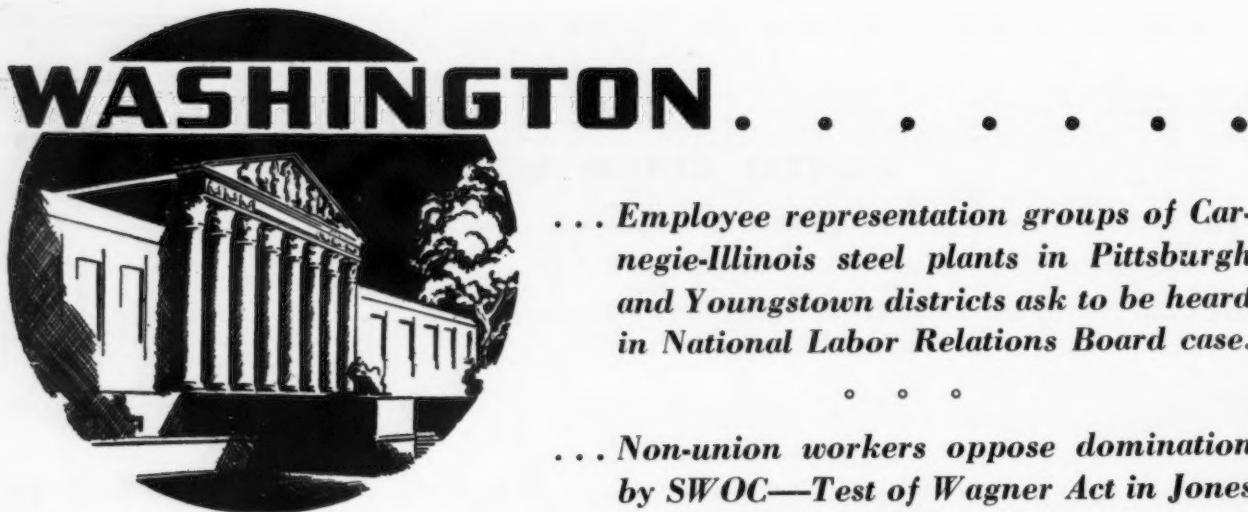
* Revised.

PRODUCTIVE activity in the durable goods industries continued to recede last week, the decline being the fifth consecutive weekly recession since the year began. THE IRON AGE's index dropped from 85.9 to 85.3 per cent of the 1925-27 average, after adjustment for seasonal variation. Actual volume of goods produced was slightly higher during the week, but the expansion was less than usually occurs at this season and led to a drop in the adjusted index.

Steel mills increased their operations to 79 per cent of effective capacity last week from 75 per cent

previously, but there was a loss in automobile assemblies as a result of shutdowns occasioned by strikes. Ward's estimated the loss at 4610 units. Railroad movement of lumber showed a less than seasonal rise, with the flood in the Ohio and Mississippi River valley districts a restraining factor. Funds allotted during the week for heavy types of construction declined to \$41,500,000, but volume of work currently progressing in this field was higher. Industrial activity at Pittsburgh showed a moderate gain.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.



WASHINGTON.

... Employee representation groups of Carnegie-Illinois steel plants in Pittsburgh and Youngstown districts ask to be heard in National Labor Relations Board case.

... Non-union workers oppose domination by SWOC—Test of Wagner Act in Jones & Laughlin case comes before Supreme Court this week.

... President Roosevelt's Supreme Court move believed to be aimed at paving the way for new NRA and AAA legislation.

By L. W. MOFFETT
Resident Washington Editor,
The Iron Age

WASHINGTON, Feb. 9.—Aroused over the efforts of the Steel Workers' Organization Committee, offshoot of John L. Lewis' Committee for Industrial Organization, to unionize the steel industry, employee representation groups in plants of the Carnegie-Illinois Steel Corp. in the Pittsburgh and Youngstown districts are attempting to preserve their plans against SWOC attacks. To this end they have filed with the National Labor Relations Board a petition to intervene in existing hearings before the board.

The hearings are the outgrowth of a complaint issued by the board at the behest of the SWOC. The complaint involves various charges, such as discrimination against SWOC workers, but its underlying purpose is to set up the SWOC as the exclusive collective bargaining agency in the Carnegie-Illinois plants and ultimately to establish it in like position throughout the steel industry of the country.

The employee representation groups seeking intervention in the case have asked through Attorney Wolfe of Pittsburgh that they be permitted to lay their case before the board to prove that the company neither coerces workers nor interferes with collective bargaining. The plan, they insist, is working successfully and should be continued in the interest of the work-

ers and their families. The petition makes it clear the employee representation groups resent outside interference by the CIO and its offspring, the SWOC.

Examiner Wood of the NLRB is expected to rule early as to whether or not he will grant the petition.

The petitions of intervention are practically identical and were filed on behalf of employee representation plans and employees through their representatives from 11 of the 18 Carnegie-Illinois plants in the Pittsburgh and Youngstown districts. The plants are the Mingo, Farrell-Mercer, Farrell furnaces, Isabella, Rolling Machine, River Transportation, Guernsey, Wood and Vandergrift in the Youngstown district and the Duquesne plant in the Pittsburgh district. The Duquesne petition was filed for the plan alone and not the employees. It is at Duquesne that E. J. Maloy, SWOC agitator, is employed.

Examiner Wood questioned Attorney Wolfe extensively. He wanted to know how meetings of employee representation groups were arranged, the plants to which the petitions applied, where and by whom the petitions were drafted, how the employees and employee representations groups were being financed. Wolfe pointed out that the meetings were held by the em-

ployees upon their initiative, that he had prepared the petitions at their request and that the employees were financing the proceedings before the board through dues assessed against themselves and entirely independent of the company. He said that a petition from the Laughlin works had been prepared but was not signed though a resolution of endorsement was adopted.

Wolfe told Examiner Wood that he was employed, following a meeting in the Pittsburgh-Youngstown district, by a defense committee which was formed to actively defend the employee plan.

"I think that their feeling on this matter has become more and more intense as the case developed," Mr. Wolfe said. He said he felt that the men "never fully appreciated the possibilities of the plan until they were confronted with the possibility that through this proceeding in which the plan is only indirectly involved *** it might be taken away from them and leave them without anything that they would consider a satisfactory substitute."

Mr. Wolfe explained that the petitions, 10 on behalf of employees from 10 plants, and 11 for that many employee representation plans, were drafted in this form because he was not clear as to



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what position the NLRB would take as to whether or not the plans are labor organizations under the Wagner Act and therefore permit intervention.

Men "Jealous of Their Rights"

The men, said Mr. Wolfe, were so "jealous of their rights under the plan that they were fearful that the company, looking after its own interests down here, might give no attention at all to the plan from the point of view of the men" and because of this the men sought representation in the "hope of giving the board a brief cross section of the plan, and of the advantages that they have had under the plan, and of the advantages that they hope to accomplish in the future." The employees, Mr. Wolfe pointed out, "took the position that the plan, whatever its defects might be, offered great possibilities, and had already resulted in great advantages to them."

The men feel, he stated, "that they have an advantage under the plan, in that if a situation becomes serious and they resolved on a strike, that a plant strike by opening possibilities of the business going to a competitor, would perhaps be a more effective weapon than a general strike, which might possibly include competitors' plants." Mr. Wolfe said the men he represents feel that they could "not have been coerced or dominated or controlled unless they had submitted to such domination."

"They also tell me that they, as well as their wives, felt more secure, both as to their employment and as to their pocketbooks, with the present plan, than they might be under any substitute that might be put in its place, if this board * * * should strike down the plan as was done in the International Harvester case," said Mr. Wolfe.

Asked by Examiner Wood why the Clairton works was not included in the petitions, Mr. Wolfe said that he had been informed that the men there "felt just as strongly as the others but were going to do their battling out of court and not in court. They would centralize their work at home."

Says Men Might Suffer If Plan Were Thrown Out

Examiner Wood questioned the attorney regarding the meaning of various phrases in a petition from the Farrell-Mercer plant. Asked about the phrase "material interest," Mr. Wolfe said that "the men with whom I have discussed this whole subject feel that under the plan they have something in the nature of a vested right, and up to now have had that largely

without money and without price and without the assessment of dues." He added that the men consider that if a substitute organization was submitted and forced upon them with not only dues, but the right to assess, that might very seriously affect their personal pocketbooks as a direct result of the adjudication of the case whether or not the Carnegie-Illinois Steel Corp. has violated the Wagner Act. Also, he said, the men were concerned as to whether the board proceeding might result in striking down their organization and thus affect their pocketbooks and their freedom of existence.

In the course of his presentation, Mr. Wolfe spoke of the "national

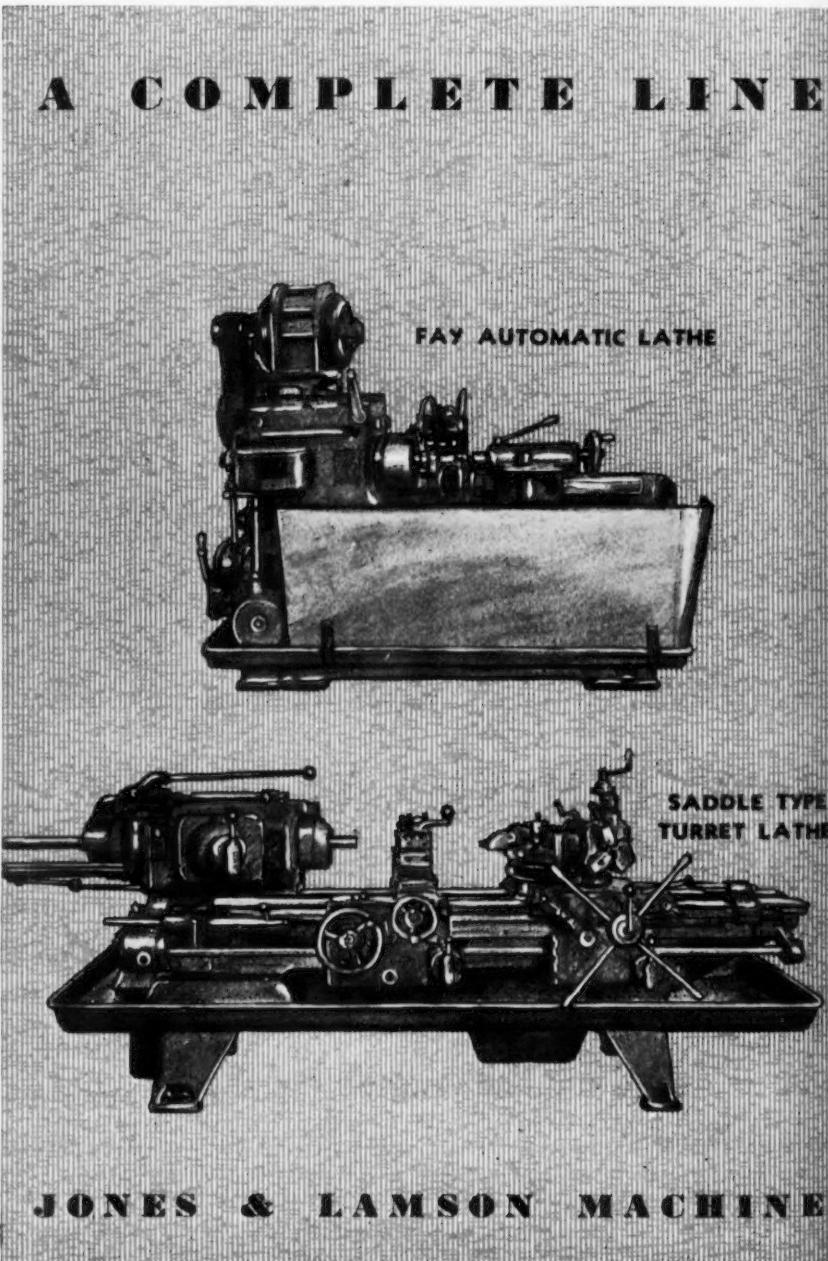
importance" of the problem involved in the plans as they affect capital and labor.

Examiner Wood, to sound out Mr. Wolfe on the matter of interstate commerce, on which is based the jurisdiction or lack of jurisdiction of the board, asked if by "national importance" Mr. Wolfe meant that "the importance of the problem might transcend State lines by any chance."

Mr. Wolfe responded that he did not.

"Do you think it might?" the examiner asked.

"I don't know," replied Mr. Wolfe. Asking if the examiner had come to the question of interstate commerce, Mr. Wolfe said



that, if so, he would "state freely" that he had not thought of defending on any such ground or attacking either the act or the jurisdiction of the board. Mr. Wolfe added that he did not have in mind the question of State lines when he used the word "national."

"Is it your position that the board does have jurisdiction in this case?" the examiner inquired.

"So far as we are concerned, that is our position," replied Mr. Wolfe.

Asked on what basis he reached that conclusion, Mr. Wolfe said his understanding of the law is that the general welfare clause of the Constitution justifies the Wagner Act and that it should be read in that way.

Examiner Wood inquired as to what facts Mr. Wolfe expected to bring forward in support of his contention that the company does not dominate workers under the employee representation plan. Mr. Wolfe replied he would offer testimony of the men who have been in official capacities that they have been conscious of no fear of interference, coercion or domination by reason of their activities on behalf of the men whom they represent. The men, said Mr. Wolfe, feel that the organization up to now has justified further trial and are asking the board to protect them in the future, not only against possibilities of an order of the board destroying the plan, but also the possibility that the company

itself might change its mind "tomorrow or next day."

In answer to a question by Examiner Wood, Attorney Wolfe said that a petition for intervention previously filed by Attorneys Wham and Pendleton for Chicago-Gary district employee representation groups was followed closely in the drafting of Mr. Wolfe's petitions.

More Steel Required In Tank Ships

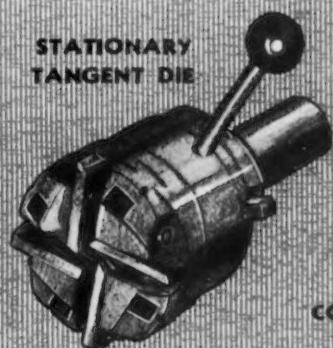
WASHINGTON, Feb. 9.—The hull and deck houses of new tank ships must be constructed of iron or steel, except that the pilot house and wood decks over quarters may be constructed of wood. General rules and regulations to this effect have been prescribed by the Board of Supervising Inspectors of the Bureau of Marine Inspection and Navigation. The bureau also has instructed inspectors that after Nov. 10, 1937, no existing wooden tank barge carrying oil or other inflammable cargo in bulk will be certificated unless the cargo is contained in iron or steel tanks constructed separately from the wood hull. The bureau has pointed out that the care taken in the preparation of new rules was necessary from the fact that over one-fourth of the merchant marine of the United States will operate under them.

British Auto Makers May Buy Our Steel

LONDON (*Special Correspondence*).—A memorandum which discusses British steel prices compared with those charged by American producers and also the quality and quantity of British supplies has been sent by the Society of Motor Manufacturers and Traders, London, to the British Iron and Steel Federation.

The society suggests that representatives of the American and British industries should meet under the auspices of the Import Duties Advisory Committee, which is at present investigating the position of the British iron and steel industry, to discuss the complaints of the automobile manufacturers regarding the unsatisfactory quality and high price of British steels. The matter is of considerable importance in relation to the future course of protective duties on imported steel and may lead to more favorable treatment for imports from the United States.

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Roosevelt's Supreme Court Move May be Aimed as Protection for Proposed New NRA and AAA Laws

WASHINGTON, Feb. 9.—The country has been frequently "surprised" at proposals from Washington which have been suddenly sprung on it

the past few years. Some have been definitely fundamental. Sponsors of the proposals have insisted they would not or did not change the form of the Government. Sharp

issue is taken with such contention. The Supreme Court of the United States has on several occasions shared the latter view. Overturning such widespread plans of Federal regimentation of industry, agriculture and labor as provided by the NRA and the AAA, the court has insisted that the changes in the relationship between the Federal Government, industry, agriculture and labor were unconstitutional, proposing as they did to give to the executive branch powers that Congress had no right to delegate or in instances had delegated too broadly because Congress did not more definitely tell the executive branch just how far it could go.

In effect, a rubber stamp Congress had signed a blank check, and permitted the executive branch to make out its own ticket. When it rejected the ticket, the Supreme Court came in for a tattoo of sharp attacks. Although it turned NRA down by a unanimous decision, this finding was the object of a broadside, led by the President who called it a "horse and buggy" decision. Thus so-called liberals and conservatives on the Supreme Court were alike blanketed in the condemnation heaped upon them. When split decisions adverse to the Administration program were handed down care was taken by critics to discriminate between the minority and majority. The majority, characterized as Tories, were subjected to a verbal lash. The minority, known as the liberals, were either openly praised for what was called their enlightened views or their position was approved by absence of criticism. Actually there is no hard and fast division in the court. The majorities and minorities groups shift, depending on the specific decisions made. Some who have been accorded praise as "liberals" when upholding the Administration on a particular law later were subjected to attack as Tories for holding against the Administration on other laws. An example is Chief Justice Charles E. Hughes. Frequently he has been in the minority as well as in the majority in support of administration measures. But when sharing the majority view which threw an Administration law out, he has been subjected to attack as a conservative.

President Has Urged More Liberal Interpretation of Laws

The upshot of these adverse findings has been that, whatever merit or lack of merit of the invalidated laws, they could be enacted and enforced only by an amendment to the Constitution. The Supreme Court is not called

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upon to pass upon the intrinsic merit or lack of merit. It is only concerned with the matter as legislation which is or is not within the Constitution. The President, however, has not seen fit to propose a constitutional amendment, be the reason what it may. Rather, in his recent message on the state of the Union, he said, in effect, that he had no quarrel with the Constitution as it now stands. Instead, he quarreled with and lectured the Supreme Court. He urged a more liberal interpretation of laws by the Supreme Court.

He has now, however, turned to the most startling proposal of the frequent "surprises" that he has thrust upon the country. His plan of a sweeping reorganization of the entire Federal judiciary, spectacularly laid before Congress last Friday after a secret meeting of the cabinet, easily is the climax of all the historic and fundamental proposals he has offered. Its connotation is hardly paralleled in significance. It is relatively an exclusive group, headed by the President himself, who joins in his view that the change he proposes is less "fundamental" and less "far-reaching" than a direct amendment to the Constitution would be.

The President's adroitly worded message included two vital proposals, one calling for reform of the entire court structure of the country and the other for an increase in the membership of the Supreme Court. Of the two the latter plan vastly outranks the former in importance. Under it he would be enabled to appoint six new members of the Supreme Court, increasing its personnel to 15, and to appoint an additional judge to any Federal Court. Where a member of any Federal Court had reached the age of six months past 70 years he could be retired. Not only did the President lay his plan before Congress, but he did the unusual thing of accompanying his message with a draft of legislation, prepared by the Department of Justice at his request.

There was, of course, mixed reaction in Congress to his message. Warm approval met with hostile criticism, with neither confined to party lines. With an overwhelming majority back of him in Congress, the predominant note was one of approval of the President's revolutionary plan. However, its scope is so broad and the change proposed so fundamental that crystallized sentiment in Congress will develop only after hearings before Congressional judiciary committees, and also after hearing from the country. Just now the view is that, though revision may be made,

much of the plan, far-reaching in character, will get through the Executive-dominated Congress. The usual trick, so common following the election, of seeking legislative authority under the guise of a "mandate" of the people, is being employed.

Critics Charge "Packing" of the Supreme Court

Critics of the plan made no bones of charging that the proposal is to pack the Supreme

Court by Presidential selection of six new members, ready to bend to his will, and thus making of the court a mere hand-maiden of the White House. Critics said that this, of course, means absolute dictatorship, and scorned efforts to camouflage it in subtle phrases and by sophist reasoning.

Congressional critics said that already Congress has brought upon itself the contempt of the country because of its ready truckling to Executive dictation and that, if



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the President's plan to reorganize the judiciary is successful, like contempt will be directed at the Supreme Court. Those who found some merit in the general object of the President's plan insisted he should not be permitted to set up a personal government, at least without letting the country at large pass upon the proposal. Approval from them then, indeed, could be properly called a mandate. Objection also has been made that with the broadened appointive power in the hands of the President, even in the extremely doubtful prospect that it would serve well as an immediate measure, it "may torment us on many a morrow," to quote Senator Borah, of Idaho, prominent constitutional lawyer.

The message of the President obviously has been interpreted to mean that he wants to jam through legislation, and to secure it against invalidation. His program for fixing hours, wages, guaranteeing collective bargaining and setting up fair trade practices is evidently the outstanding issue he has in mind. Fear is felt that it definitely would not stand Supreme Court test under the Court's present structure. This obstacle easily could be swept away through the appointment by the President of six new members of the Supreme Court. Or, at least, it is assumed he thinks his legislation would be as "liberally" interpreted by a majority as he desires under such an expanded Supreme Court personnel. His remarks about the infirmity of age, in the proposal to cast aside as members of the Court those past 70 years, were bitterly resented by members of Congress now past that age, but keen mentally. The remarks also were looked upon by many as designed to bring the Supreme Court into contempt.

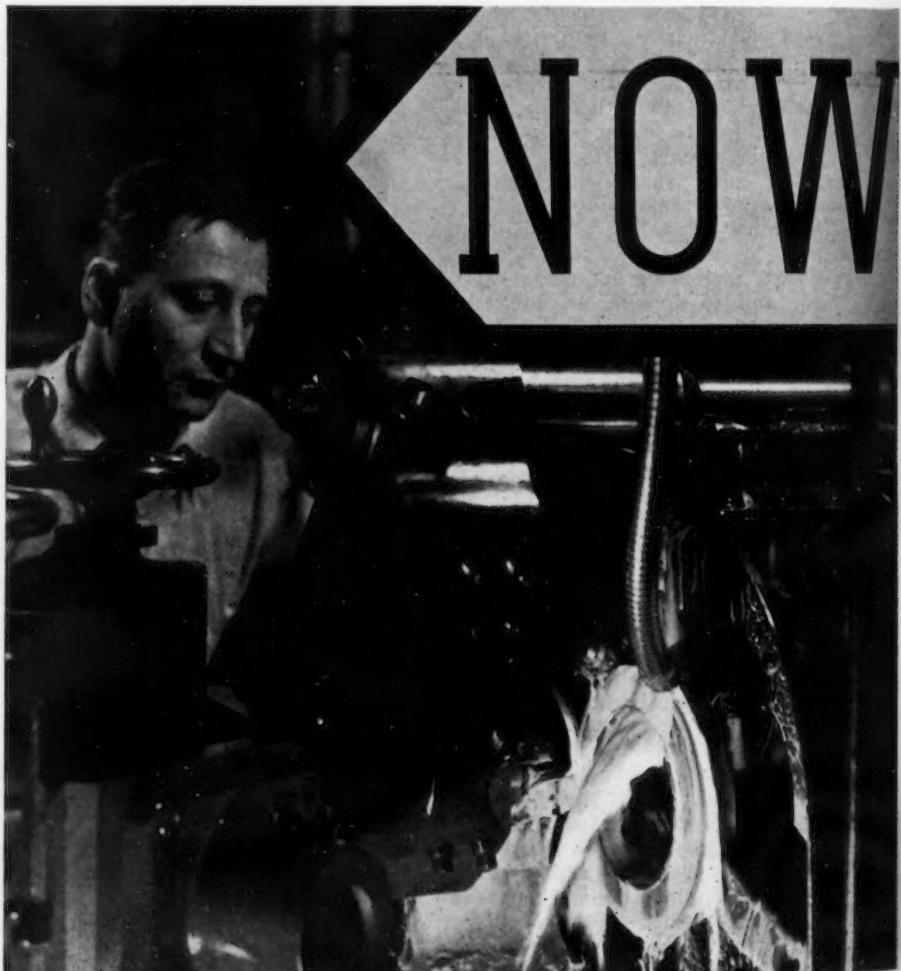
John L. Lewis Believed to Have Had Hand In It

The move also has raised the question as to whether John L. Lewis had a hand in it. The White House recently has announced that it has no "official spokesman." It assures the country it does its own speaking. No doubt it does. Nevertheless, its speaking has been most acceptable to Lewis. In sonorous and pontifical tone Lewis has raged bitterly against the Supreme Court, and, much to the disgust of the American Federation of Labor, the bombastic leader of the Committee for Industrial Organization has risen to great prominence as a consultant in Administration councils. It is unlikely that Lewis is at all disturbed by the oblique and mild rebuke he is sup-

posed to have been given by the White House recently when, as if in return for heavy financial contributions he made to the New Deal campaign, he asked for Presidential intervention in the General Motors strike.

Lewis hardly could be concerned over that "rebuke." What followed would not seem to justify any concern on his part; quite the contrary. Shortly after the "rebuke" was "administered," it has been observed, the President virtually commanded General Motors officials to confer personally over the General Motors strike situation. Lewis had previously said, as if assured, that sooner or later he would sit face to face with them. He was not discouraged, though he was enraged, at abortive efforts of Secretary of Labor Frances Perkins to bring about conferences between him and General Motors officials. Even while, or before, he was on his way from Washington to Detroit, Gov. Frank M. Murphy of Michigan had been directed by the President to act as an intermediary to bring about negotiations between Lewis and General Motors officials.

The Navy Department gets into a jam because of refusal of steel makers to submit bids on steel urgently needed by the Navy in connection with its building program. The obstacle is the Walsh-Healey Act. The matter is taken up with the Department of Labor. Lewis, so it has been reported, and not denied, was called in by the department to give his views on the situation, and is supposed to have stood adamantly against any relaxation of regulations covering the law, a law, by the way, that President Green of the A. F. of L., and not Lewis, pushed through Congress. Though Lewis intimated that exemptions of three months' intervals would be granted to permit purchase of steel, he is said to share in the purpose, if he did not suggest them, of amendments to tighten the law further. Said to have been sent to Labor committees in Congress, one would reduce to \$2,500 from \$10,000 the prevailing exemption on Government contracts under the law. The other amendment is said to require that successful bidders on Government contracts certify that all material supplied by them was pro-



duced under the terms of the act. That is to say, secondary suppliers, as distinguished from prime contractors, would have to adhere to the terms of the act. This proposal was incorporated in the Walsh-Healey bill when it was first considered by Congress, but before passage of the measure the proposal was knocked out because of the complexity, if not impossibility, of its administration, as well as its unfairness to the prime contractor.

Congressional Investigation of General Motors Proposed

Senator Neeley, Democrat, of West Virginia, has introduced a resolution calling for a sweeping investigation by the LaFollette Civil Liberties committee of the financial and labor structure of the General Motors Corp. Tied in with this Lewis-dictated resolution is an amendment, sponsored by Senator Borah, calling for a like investigation of the agricultural implement industry. But at the suggestion of Senator Neeley, final action on the resolution awaits testimony before the Senate Com-

mittee on Education and Labor by Lewis. Lewis, so it is reported, may want to expand the resolution. He may want to include the steel industry in the proposed investigation to help along with his drive to unionize steel. Obviously, he will not have to combat the effort of Senator Holt to have the investigation include Lewis's own CIO. Senator Neeley served notice he would not stand for an investigation of organized labor in any way, shape or form, and he has an overwhelming majority in the Senate back of him on that score.

Congress Afraid to Oppose Lewis

A like political sentiment prevails in the House. There is widespread "off the record" sentiment in Congress against Lewis and his organization, but in view of the Administration consideration of Lewis, and also of labor support back of him, Congress is afraid to oppose him. That is a rather sorry spectacle and a rather alarming commentary on Congress, but it is the picture. On the other hand, this fear is mixed with a fear that Lewis is a threat to the Democratic party. These mixed fears, there-

fore, put these apprehensive members of Congress on a spot. Also these fears, together with other evidence which has been highlighted, indicate the astonishing prominence Lewis plays in the Government of the United States, without official title though he is. Which, in the minds of many, is rather ironic when attention is diverted to the scorn Lewis has shown toward organized government, including his disregard of the court injunction to oust sit-down strikers in General Motors plants. He is in favor of cracking the law down on industry that challenges him, no matter how sound the merit of the challenge. But he scorns the law when it would crack down on him, and the country sees the amazing picture of Lewis getting away with it.

The sharpest attack on Lewis comes from his rivals in the American Federation of Labor, as shown by the biting criticism directed at him by John P. Frey, head of the Metal Trades Department of the Federation. No mincing of words for him, Frey assailed the "militant minority theory and practice of Lewis's CIO as bearing the hallmark of Moscow" and vigorously denounced the sit-down strike method used by Lewis. Assailing Lewis for his conduct of his campaign to unionize mass industries, Frey struck at the sit-down strike as an importation from Italy, "which gave Mussolini the opportunity of issuing those edicts which destroyed the voluntary trade unions of the country."

Navy Buying Piece-meal Under Walsh-Healey Act

Lewis, however, has not entirely stopped the Government from purchasing supplies, but, because of the Walsh-Healey Act., some of the purchases are on a piece-meal basis.

Last week the Navy bought 885,000 lb. of copper, but had advertised for 2,735,000 lb. The quantity obtained comes from stocks on hand, to which the act does not apply. Of the lots bought, 450,000 lb. was awarded to the American Metal Co., at 13.05c. per lb., delivered Brooklyn Navy Yard, and 435,000 lb. was awarded to the American Smelting & Refining Co., at 13c. per lb., f. o. b., Tacoma, Wash., for delivery to the Mare Island, Cal., Navy Yard.

The Navy also purchased 360,000 lb. of ingot tin, 320,000 lb. from Tuthill & Co., New York, at 50.83c. per lb., and 40,000 lb. from The Pope Trading Co., New York, at 51.23c. per lb. All of the material is for the Brooklyn Navy Yard.

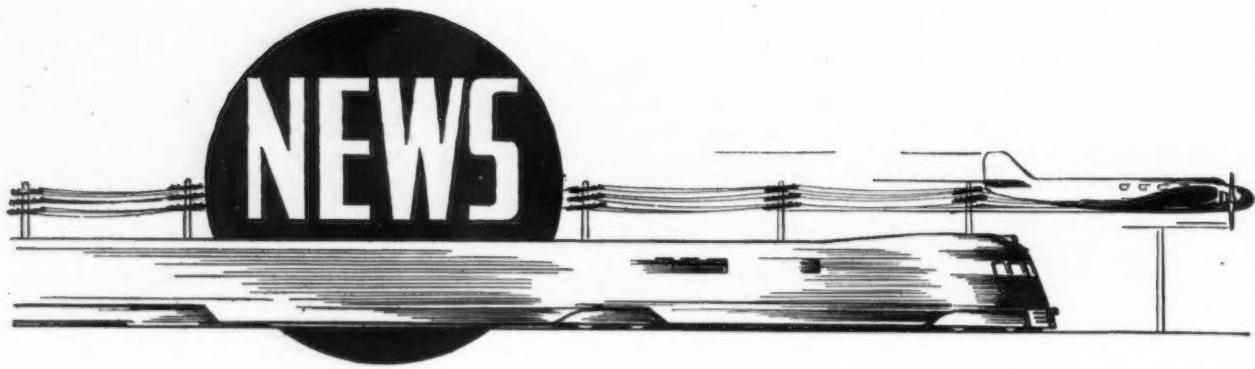
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Now is the time. Call Warner & Swasey, Cleveland.

WARNER & SWASEY Turret Lathes
Cleveland



Republic Steel Takes Steps to Acquire Gulf States Steel Co.

THE Republic Steel Corp., which for some years has owned more than 30 per cent of the common stock of the Gulf States Steel Co., Birmingham, has made a proposition to that company for complete ownership and control, according to an announcement issued last Friday by T. M. Girdler, chairman and president of Republic. A similar announcement was made by W. H. Coverdale, president of Gulf States Steel Co. Mr. Girdler's statement was as follows:

"Republic Steel Corp. has made a proposition to Gulf States Steel Co. which contemplates as its main feature the sale to Republic of all the property and assets of Gulf, the assumption by Republic Steel Corp. of the outstanding first mortgage sinking fund 4½ per cent

bonds and other indebtedness of Gulf States Steel Co., the distribution among the holders of common stock of Gulf States Steel Co., of common no par value stock of Republic Steel Corp. in the ratio of 2 1/3 shares of such stock of Republic Steel Corp. for each one share of Gulf States Steel Co. common stock so held, and the dissolution and winding up of Gulf States Steel Co. To effect any such sale the vote in favor thereof of the holders of a majority of the outstanding common stock of Gulf States Steel Co. will be necessary.

"The board of directors of Gulf States Steel Co. has instructed its counsel, in collaboration with counsel for Republic Steel Corp., to prepare for submission to the board, and to the board of directors of

Republic Steel Corp., a form of agreement along the lines indicated and containing such provision as they shall deem appropriate, so that when each company completes such checking of the condition of the other as it deems necessary, the proposed agreement can be immediately executed and consummated as soon thereafter as practicable."

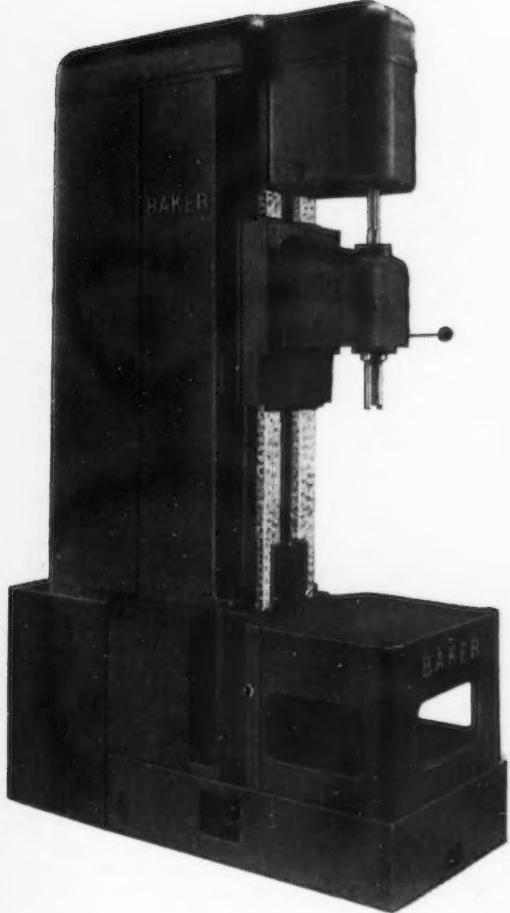
Mr. Girdler said further that the "acquisition of the properties of Gulf States Steel Co. will round out Republic's facilities in the South."

At present Republic Steel owns ore and coal mines and blast furnaces, but has no steel finishing facilities in Alabama. Some months ago Gulf States announced that it would spend about \$2,500,000 for equipment to produce tin plate, and it is generally assumed that Republic might add other finishing capacity, possibly for the manufacture of its electric weld pipe, for which there has been a large de-

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Modern in appearance and performance, the Baker Cleanline machines are recognized as an outstanding advance in machine tool design. Complete enclosure of moving parts is an important factor in shop safety and protects the machine from wear due to dirt. The exterior of the machine can be kept clean easily and the construction permits easy accessibility to parts for any necessary adjustments.

The Cleanline machines are available in a range of sizes and can be adapted to specific requirements. They are furnished in single or multiple spindle with feed cycle to suit the work.

For drilling, boring, or tapping operations, Baker machines turn out the work with a low cost figure. Let us check your production costs for these operations against costs with new Baker equipment. Send blueprint or sample piece. Baker Brothers, Incorporated, Toledo, Ohio.

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mand in the oil fields of California and the Southwest.

Gulf States Steel's plants at Gadsden, Ala., will add approximately 450,000 tons to Republic's ingot producing capacity, giving the company a total of 6,450,000 tons. The finished products of Gulf States are bars, sheets and wire products. "The Gulf States' plant will greatly improve Republic's position in the increasingly important market for steel in the South," Mr. Girdler said.

Republic's properties in Alabama include two blast furnaces, with a total annual capacity of 320,000 tons, 57 by-product coke ovens, with an annual capacity of 397,000 tons of coke, and ore and coal properties.

Abolition of Delivered Price Selling Would Restrict Markets, Says Report

In view of the probable reintroduction of the Wheeler Anti-Basing Point Bill at the present session of Congress, the report of the Committee on Prices in Distribution of the Chamber of Commerce of the United States, which strongly opposes the abolition of the basing point method of selling (*THE IRON AGE*, Feb. 4, 1937, p. 132) is of timely interest.

This committee has no members who are directly connected with the iron and steel industry, although it includes representatives of companies that are buyers of

steel, such as C. J. Whipple, president of Hibbard, Spencer, Bartlett & Co., the Chicago hardware jobbing concern, and D. M. Nelson, vice-president of the Chicago mail order house, Sears, Roebuck & Co. Malcolm P. McNair, director of research of the Graduate School of Business Administration, Harvard University, is a member, and the chairman is John A. Law, president and treasurer of the Saxon Mills, Spartansburg, S. C.

In its summation, the report says that any law that would prohibit selling at delivered prices would "restrict the sources of supply available to buyers and restrict markets for sellers. This leads us to conclude that any attempt, through legislation or otherwise, to prohibit selling at delivered prices should be opposed."

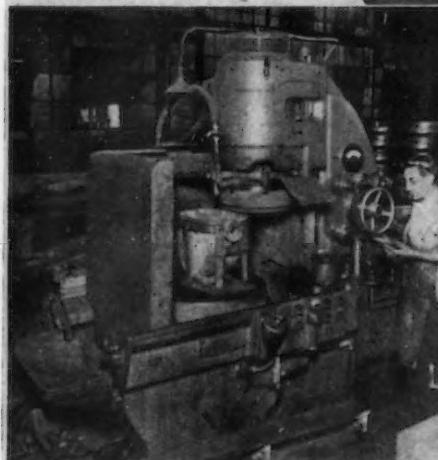
"From the standpoint of preserving competition," says the report, "the basing point and other systems of delivered pricing offer the only practical means as yet devised for achieving this purpose in the case of industries where production and markets are widely separated and where transportation costs constitute a large proportion of the delivered price. Industrial enterprises of this character often require large investments of capital. Their operation depends not merely upon close proximity to sources of their essential raw materials but upon a wide distribution of their products. Such distribution is possible only if they are able to meet competition not merely in territories immediately adjacent to their plants but also in territories in which competing plants are located. This, in turn, depends upon their ability to quote prices on the basis of delivery at destination.

"To the seller, inability to quote delivered prices including all or any part of delivery costs would tend to restrict his market to contiguous areas in which his shipping-point price plus freight to a given destination would be less than the shipping-point price plus freight of any competitor outside that area.

Effects of Alternative Proposal

"While this might mean an advantage for some sellers relieved of competition from a distance in their nearby markets, they would simultaneously lose their markets in areas nearer to competing plants. There also would be less flexibility, as, for example, a market normally good might be abnor-

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The illustration shows a No. 18 Blanchard grinding one surface flat to within .002" on a 19" x 14" x 16" high semi-steel meter body. Stock removed $\frac{1}{16}$ ". Production 6 per hour. This is double the quantity formerly secured by a planing operation. If you have flat surfaces to be machined let us suggest what can be done with a Blanchard. Send sample pieces or blueprints. No obligation.



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mally low during some year because of an isolated drought condition or of other factors causing local depression. In another year the same area might provide, for various reasons, an abnormally good market. If producers were forced to limit themselves to areas contiguous to their plants, they would have to provide sufficient producing capacity to take care of peak demands and accordingly would have excess producing capacity when local conditions were unfavorable. The result in the country as a whole would be a large excess of producing capacity which would be idle and cause unemployment except in peak years in each territory taken singly. Selling at f.o.b. mill prices also would mean unevenness in prices among areas with corresponding handicaps for purchasers that buy for use in further manufacture. The whole tendency would be to replace influences promoting stability in operations and employment with influences causing confusion and instability both in operations and prices—first, among primary producers; second, among members of industries that buy materials for further manufacture; and, third, among centers of wholesale merchandising.

"Such conditions might well lead to much readjustment in wholesale trade areas and to much relocation in industries of many kinds, with advantage in the hands of large concerns financially able to place establishments in each of the large market areas. Smaller concerns, distant from markets and lacking means for such a procedure, would be particularly affected, in many cases having to curtail operations, and even to close down.

"Actually, in many instances the dislocations which would occur would prove disastrous to the communities in which plants and wholesale houses are now advantageously situated. Not infrequently the growth of communities has been largely due to their development as important distributing points. Unless such communities were also within large consuming areas, their value as distributing centers would be very materially diminished with consequent losses of revenue and of opportunities for employment.

"If any doubt were entertained regarding the consequences which have been outlined above, and it is argued that more distant merchants and manufacturers could resort to other methods for continuing to reach their more distant markets, it is to be pointed out that these other methods would entail increased costs. These increases in costs would add to the influences which have already been mentioned

as tending to result in higher prices that would follow compulsory pricing on a basis of f.o.b. shipping point.

"Basing-point and other systems of delivered or partial-delivered pricing find their greatest justification in the advantages they give to buyers. Under present methods of distribution purchasers far removed from sources of supply are free to buy from more than one source, with complete and accurate knowledge of the cost of the goods to them at destination. The smaller retailers do most of their buying on this basis having choice among sources of supply. Any plan which prevented the seller from absorbing any part of the transportation costs would frequently compel a purchaser to buy from the

nearest source of supply, thus restricting competition for the purchaser's business and at the same time restricting his buying opportunities.

"To require sellers to quote prices f.o.b. shipping point would tend to place more burdens on small businesses than upon large businesses. Companies operating single establishments would face difficulties in their selling which would not be encountered by companies operating more than one establishment. Companies with large resources could shift their plants and warehouses more easily than could companies with small resources. There would be a tendency for large companies to integrate their operations in the procurement of raw material, in the establishment of plants,

FRONT PAGE NEWS !!

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Believe it or not, that is what one of these fine tools is actually doing today. It's an interesting story. We cannot promise savings like that in every case, but it should be worth investigating.

Capacity—24" x 8" x 12"

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EAST PROVIDENCE, R. I.

and in the operation of warehouses on a widespread scale.

"Prohibitions against any delivered price systems might work to the advantage of buyers of large quantities of goods because they could establish themselves near sources of supply to better advantage than smaller organizations. Buyers, especially small retailers, situated at a distance from large producing or shipping centers, would be at a disadvantage with competitors located nearer sources of supply.

"Complaints against the various forms of delivered pricing have alleged the tendency of their pricing methods to promote uniformity of price. The use of basing points, for example, not only brings into a market sellers who otherwise could not reach it, but tends to bring about some uniformity in the prices of all sellers at one time in the market. This effect is due to the market and not to a lack of competition. It is the function of a market to afford all sellers an opportunity to obtain the going mar-

ket price as it exists for the particular time. An orderly market likewise tends to make changes in market price gradual rather than sudden and disastrous for buyers when there is an unexpected shortage of supplies and for sellers when there is an equally unexpected plethora. That delivered price systems tend to promote uniformity in prices in this sense and orderliness in price changes is from the point of view of the public interest an argument in favor of their use and not an argument against them. The Supreme Court has held that uniformity of price may reflect and be consistent with free competition and has upheld measures taken to promote orderly markets.

"If abuses arise in any market, through collusive arrangements or otherwise, there exists legislation through which remedies can be sought. For the purpose of dealing with situations of this character Congress has provided remedies as in the Sherman Anti-Trust Law, the Clayton Act, and the Federal Trade Commission Act.

The Public Interest

"There is a definite public interest in the preservation of the right of sellers to quote on a delivered basis. In so far as delivered pricing systems enable producers to locate their plants in sections removed from congested purchasing markets and where they can most successfully perform the operations of production, to this extent such pricing systems tend to decrease costs and prices, and to spread employment. The placing of industries and wholesale businesses where conditions for production and distribution are most favorable is dependent upon these factors. By extending selling areas delivered pricing systems ensure to purchasers the benefits which flow from competition among sellers and, in so doing, operate to keep down and reduce rather than raise price levels. And, above all, they serve as an effective barrier to the restriction of competition in important markets by working against the dominance in any section of the country of any seller or group of sellers.

"As a result of delivered prices:

- (a) The market price is as low as the lowest offered by any seller serving that market;
- (b) Sellers can ship to any markets they choose;
- (c) Buyers in any market can buy from any of several sellers serving that market at a price equal to the lowest offered by any such seller."



"Simply Amazing Control"

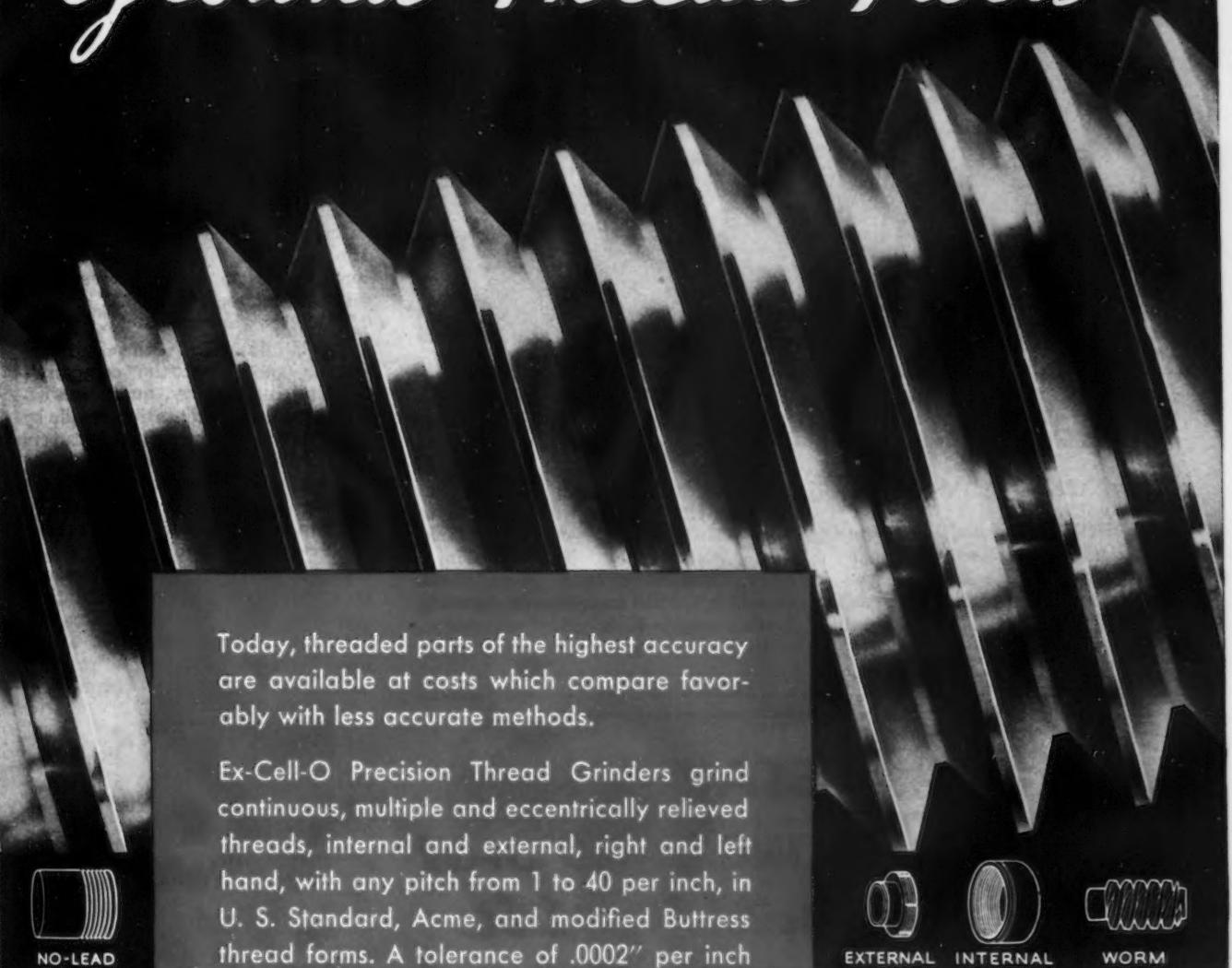
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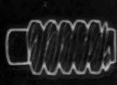
You are invited to make use of Ex-Cell-O's own completely equipped thread grinder department and of any of the many other Ex-Cell-O precision operations which may be involved in your product. Quotations will be gladly furnished from your blue print.



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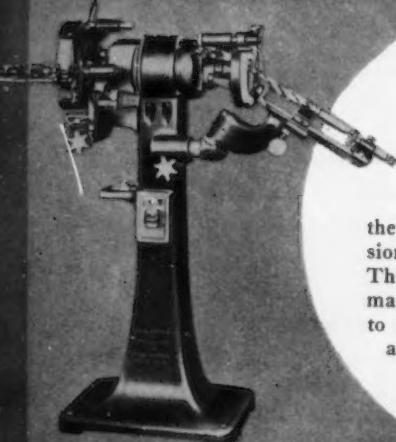
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Taps and drills cut faster when they are kept sharp—they last longer when they are correctly ground. Grand Rapids Grinders do the grinding in half the usual time and with a precision that eliminates tool breakage. They can save you money. We make many types and sizes in addition to the No. 10-B Combination Tap and Drill Grinder shown here.

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ALLMEYER & LIVINGSTON CO.

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Grand Rapids, Michigan

Richard Thomas & Co. To Add New Mills

LONDON (Special Correspondence).—Richard Thomas & Co., Ltd., has floated an issue of \$35,000,000 convertible debenture stock to finance a large development program.

At Ebbw Vale will be erected a combination billet, blooming and slabbing mill, with a capacity of 900,000 tons a year; a continuous hot strip mill, with a capacity of 600,000 tons a year, capable of making steel strip 48 in. wide from 2 in. thick down to 18 gage; cross rolling mill capable of making sheets up to 72 in. wide; cold reduction plant—plus a finishing plant

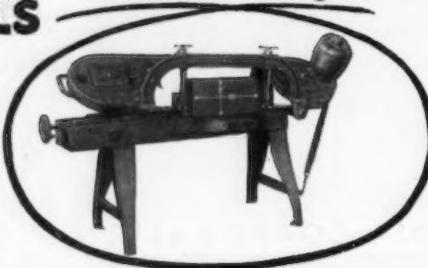
HERE IS A METAL CUTTING BAND SAW
*that is - versatile portable
accurate economical*
*that will cut - bars tubes
angles flats*

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Built in two sizes—No. 8 capacity, 8" diameter round or 8" x 16" flat—No. 5 capacity, 5" diameter round or 5" x 10" flat.

WELLS
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capable of producing 370,000-400,000 tons per annum of highest grade sheets and tinplates. All equipment will be of the latest American type.

At Redbourn works, Scunthorpe, a modern coke and by-product plant will be erected, which, together with the new coke ovens at Ebbw Vale, will increase the coke capacity by approximately 650,000 tons annually by June, 1938.

The company constitutes, with its subsidiaries, one of the largest undertakings in the British steel industry. During the last four and one-half years it has bought up 17—mostly successful—competing businesses, none of whose costs compared favorably with those of the group, so that the resultant advantages have not yet been fully realized.

When the development program is completed the company's capacity in ingots will be 1,650,000 tons and its sheet and tinplate capacity will be between 1,150,000 and 1,180,000 tons annually.

Sir William Firth, the chairman, in his speech at the company's meeting in January, quoted an extract from representations made by the Society of Motor Manufacturers and Traders to the British Iron and Steel Federation criticizing the quality of certain British steels issued in the production of automobile bodies. It is claimed that the company's new process will entirely remove these defects and thus stop automobile manufacturers from their threatened step of entering the steel industry to produce steel suitable to their requirements.

Sheet & Tube Adopts Group Insurance

GROUP life insurance plan announced by the Youngstown Sheet & Tube Co. for its Youngstown and Chicago district plants, under which the company shares the cost of insurance with the employees, is generally similar in the terms to some group insurance plans that are already in effect in the steel industry.

This plan supplements the protection already provided by the Employees Benefit Associations and is an extension of the group plan of insurance that previously had been provided for salaried employees to all employees of the company.

J. I. Case Co., Racine, Wis., has purchased the plant of the Rock Island Plow Co., Rock Island, Ill. The plow shops occupy about 22 acres on the West side of the city.



PERSONALS..

FRANK CORDES, president, Blaw-Knox Co., Blawnox, Pa., has been elected chairman of the board of



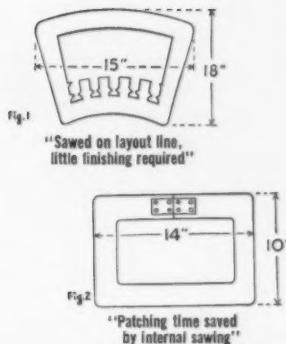
FRANK CORDES



CHESTER H. LEHMAN



WILLIAM P. WITHEROW



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... It has been our experience in making irregular shaped dies, that the sawing and filing method has practically eliminated the slotter or internal shaping method.

In addition to use of these machines on die work, we have used them to very good advantage for sawing out various parts used in the manufacture of jigs, fixtures and miscellaneous tools ...

GENERAL ELECTRIC CO.

DOALL DUAL

Of this new Contour Saw that makes astonishing savings in internal and external cutting, Mr. B. G. Tang, Gen. Supt. of General Electric Company's Schenectady plant, wrote the letter we quote from.

This is but one of many reports received, showing how the DOALL Contour Saw and File, through its "mastery of metal" speeds production in many applications, in addition to die making. Investigate.

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1301 South Washington Avenue
MINNEAPOLIS MINNESOTA

directors; CHESTER H. LEHMAN, vice-president, has been elected vice-chairman of the board and executive vice-president; and WILLIAM P. WITHEROW, for many years active in business and civic affairs in Pittsburgh, has been elected president. Mr. Cordes and Mr. Lehman will continue to be actively engaged in the company's operations and management.

Mr. Witherow, in assuming the duties of executive head of the company, brings a background of steel

mill and general engineering and construction experience dating back to 1908, when, as a graduate of Yale, he became associated with the Jones & Laughlin Steel Corp. Following this, he became engineer for the Truscon Steel Co. and then founded the Witherow Steel Co. The latter company acquired the Dilworth-Porter Co., both of which were later acquired by the Donner Steel Co., Mr. Witherow becoming chairman of the board of the latter company. The Donner Steel Co.

"The Saw With 100 Uses" *Universal*

Usually the busiest machine tool in any shop because it's universal—handles all sizes and does all things well. **Straight Cutting.** Any stock from $\frac{1}{8}$ " x $\frac{1}{8}$ " to 18" x 18".

Notching, Coping. Blade does not change angle when cutting off straight or square. Permits notching, coping, slotting, shanking dies, jig work, etc., by making only 2 cuts.

Automatic Stop can be set for any required depth—with feed started at any point.

Power Feed or Hand Feed moves carriage and blade. Work always held stationary.

Cutting Angles with work flat on the bed it is possible to feed the blade into the work at any angle to 45° left or right. Example: to cut a perfect mitre simply swing the upright to 45° right or left.

In your shop, whatever your work, the MARVEL No. 8 would find "a hundred uses" on which it would cut costs.



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ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
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later became a part of the Republic Steel Corp., and Mr. Witherow was vice-president of Republic until he resigned in 1932.

Mr. Witherow has been a member of the board of directors of the Blaw-Knox Co. for four years. He is a director of the Pittsburgh Coal Co., president and director of the Steel Products Co., trustee of Carnegie Institute and Carnegie Institute of Technology, director and vice-president of the Chamber of Commerce of Pittsburgh, director of the Chamber of Commerce of the United States, and chairman of the Tri-State Citizens Flood Committee of Pittsburgh.

* * *

J. ROXBURGH, president of the Sheffield branch of the Institute of British Foundrymen, will read the

British exchange paper at the 1937 convention of the American Foundrymen's Association in Milwaukee in May. Mr. Roxburgh has recently been appointed manager of the foundry and pattern shop of Davy & United Engineering Co., Ltd., Sheffield, manufacturer of rolling mill and steel works plant equipment, hydraulic and forging presses, and general engineers. He was born in Edinburgh and received his technical training at Birmingham University. After having served his time in the foundries and pattern shop of the British Thomson-Houston Co., Rugby, he was appointed in 1924 assistant foundry manager at the Brightside Foundry & Engineering Co., Newhall Works, Sheffield. Two years later he was made manager of the

foundry and pattern shop at the same works. In 1932, he became manager of the foundry and pattern shop, Newton Chambers & Co., Ltd., Thorncleiffe Iron Works, Chapeltown, a position which he retained until assuming his present duties with Davy & United Engineering Co., Ltd. Mr. Roxburgh is the author of numerous lectures and papers, for which he has been awarded diplomas. He was lecturer on foundry practice and science for two years at Sheffield University evening classes, and is a member of the Sheffield Council and the General Council of the Institute of British Foundrymen.

* * *

C. W. SIMPSON, vice-president and works manager, National Acme Co., Cleveland, started Feb. 8 for an eight weeks' business trip to various European countries.

* * *

HARRY L. MYERS, assistant superintendent of the West Leechburg division of Allegheny Steel Co., has been appointed general superintendent, succeeding NOBLE JONES who has resigned. Mr. Myers has been connected with that division since 1915.

* * *

A. G. WITTING, whose appointment as assistant to the general superintendent of the Gary Works of the Carnegie-Illinois Steel Corp. was announced in these columns last week, has been associated with the company and its predecessors

The new, revised edition of Starrett Catalog No. 25AA is the buying guide of purchasing agents and tool buyers throughout the metal-working industries. May we send you a copy?

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Manufacturers of Precision Tools
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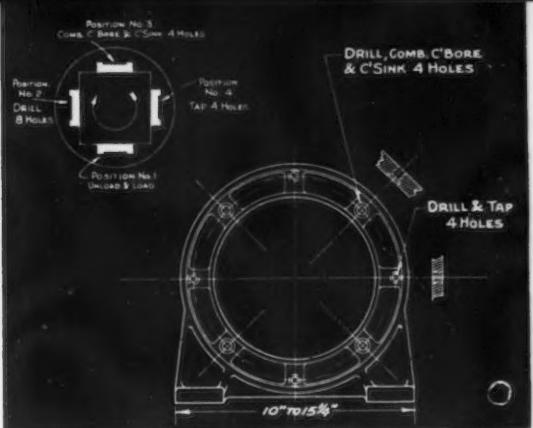
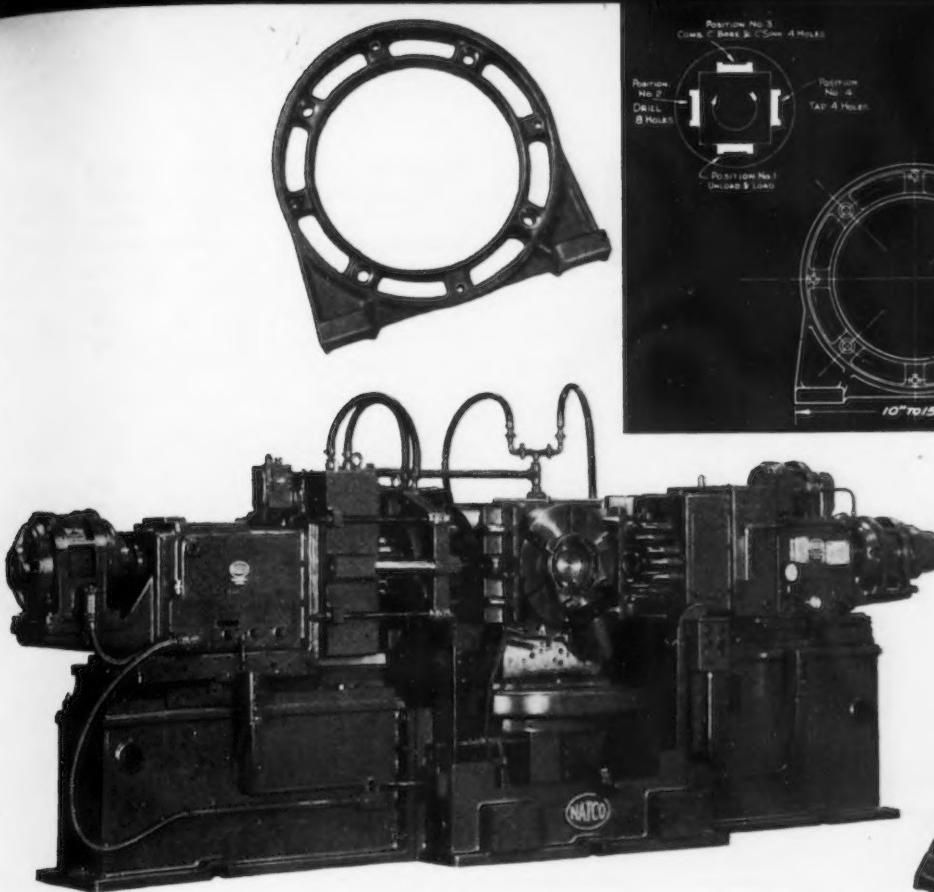
Use Starrett Tools

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A. G. WITTING

for the past 38 years. He is a graduate of the Royal Technical Institute of Stockholm, Sweden, where he specialized in metallurgy and engineering. He became identified with the Carnegie Steel Co. at Homestead, Pa., in 1899, and was later transferred to the Duquesne plant. After spending four years



20 Operations are performed on 100 Stator Frames per hour . . .

Here is the NATCO method of drilling, counterboring, countersinking and tapping motor stator frames. This NATCO machine is performing a total of 20 operations on 100 stator frames per hour.

This machine is built of three NATCO HOLEUNITS and a four position rotating type fixture arranged to hold one stator frame in each position. The operator loads the stator frame in the front loading station and as the castings index from station to station the required operations are performed. See sketch above for detailed operations.

This NATCO three-way was built for a particular set of operations and may be considered special way-type equipment. Yet it is built of standard NATCO HOLEUNITS . . . standardized

machine elements which are flexible and interchangeable. NATCO HOLEUNITS are completely self-contained and no connections other than electrical are required. Equipped with a semi-automatic hydraulic feed, they will operate at any angle . . . and may be arranged in groups to perform all the required operations with a single handling. Should the part for which the units are arranged be altered or discontinued, it is only necessary to rearrange the units, equip them with new spindle boxes and the machine may be used for an entirely different piece of work.

NATCO HOLEUNITS are built in a variety of sizes and capacities. Investigate them today. Call, wire or write for a NATCO representative today. They will be glad to make a study of your drilling, boring or tapping problems.

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Production Costs!
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Specify ARMSTRONG wrenches for greater strength and longer life, for improved designs, balance and handiness... for accurately milled openings, proper heat treatment and fine finish.

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"The Tool Holder People"

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San Francisco



with the Wellman-Seaver-Morgan Co., he went to Chicago and joined the South works of the Illinois Steel Co. In 1911 he was transferred to the Gary works. He was promoted to the post of chief draftsman in 1918 and continued until 1929, when he was appointed acting chief engineer, became chief engineer in 1933, and chief engineer of the Gary works in 1935.

S. M. JENKS, who succeeds Mr. Witting, has been located in Pittsburgh as chief engineer of the construction engineering department. He was graduated from Cornell University in 1923. After a short service with the Jones & Laughlin Steel Corp., he joined the engineering department of the American Sheet & Tin Plate Co., at Pittsburgh, transferring to the Gary

MURCHEY TYPE "G" Self-Opening DIE HEAD

Sizes 7/16" to 6" . . .



★ This die head is the pull-off type for stationary spindles. It is opened positively and instantaneously by self-contained trips actuated either externally or internally.

Set-up time is reduced to a minimum by ample adjustments for thread diameters and by chaser removal which may be effected without taking off the cap.

In this die head all parts are hardened and ground.

For economy the chasers are interchangeable with the Murchey "C-O" rotating die head. This type "G" die head is rendering excellent service in shops where production is vital.

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*Collapsible Taps, Self-Opening Die Heads;
Bolt Threading, Pipe Threading, and Pipe
Cutting Off Machinery.*

sheet and tin plate mills as fuel engineer in 1929. Four years later he returned to Pittsburgh as power engineer and in 1935 was appointed assistant chief engineer for the same company. Last September he was made chief engineer of the construction engineering division of the Carnegie-Illinois company.



L. E. MURPHY, chairman of the board of E. F. Houghton & Co., Philadelphia, has retired from active service after having been associated with the company for 48 years. The office of chairman has been temporarily discontinued. MAJ. A. E. CARPENTER continues as president.



SIR ARTHUR PUGH has retired from the general secretaryship of the British Iron and Steel Trades Confederation. He is 67, and was general secretary of the confederation for 20 years.



FRANK J. REYNOLDS has been appointed manager of the agricultural division of the American Steel & Wire Co., Chicago, under the supervision of the sales promotion-advertising department.



GEORGE C. MOON has been elected a vice-president and director of the American Chain & Cable Co., Inc., Bridgeport, Conn. He will make his headquarters at 230 Park Avenue, New York.



C. M. HOUCK, formerly manager of the inspection division of the Pittsburgh Testing Laboratory, Pittsburgh, has been elected vice-president, succeeding A. R. ELLIS, who was recently made president. Mr. Houck was formerly with the Heine Bouler Co., St. Louis, and the UGI Contracting Co., Philadelphia.



P. K. FREESE has resigned from the staff of Iron & Steel Products, Inc., Chicago, dealer in iron and steel.



CHARLES E. MCQUIGG, since 1934 director of research for the Union Carbide & Carbon Co., Long Island City, N. Y., has been made dean of the college of engineering of Ohio State University, effective July 1. Mr. McQuigg was graduated from that university in 1909. Following a year's connection with the Santa Fe Railroad, he became identified with the Anaconda Copper Co. as assistant engineer of tests. Then for five years he was head of the department of metallurgy at Pennsylvania State College. After service in the World

War, he joined the research and development laboratories of the Electro-Metallurgical Co., at Niagara Falls, N. Y. Since 1921 he has been with the Union Carbon & Carbide Co.

* * *

O. L. HOLCOMBE, a former member of the sales department of the Clark Controller Co., Cleveland, has been made district manager of the company's Philadelphia office. ROBERT H. HOGE has joined the sales force of the New York district office. J. W. HAMMANN, heretofore of the New York office, has been transferred to the Pittsburgh office to assist G. W. FIRST, district manager of that territory. W. R. UFFELMAN, who for the past several months has been at the home office, has been transferred to the Detroit office. S. J. NOGOSEK, sales engineer in the New York office, has been transferred to the home office in a similar capacity.

* * *

SAMUEL WAXMAN, president and founder of the Hub Steel & Iron Works, Somerville, Mass., has withdrawn from the firm and established the Acme Iron Works at 39 Fremont Street, that city.

MERLE N. SMITH has been appointed manager of the order division of Carnegie-Illinois Steel Corp., Pittsburgh district; JOHN R. WALKER has been appointed assistant manager of the order division, Pittsburgh district, while WALTER J. WELDIN has been made assistant to general manager of the order division of the general sales department.

The three positions are new, created after more than a year of study of the entire subject of order procedure and organization throughout the company, including activities in the district sales offices, the general offices in Pittsburgh and Chicago and the manufacturing plants. The object of the study has been to improve standards of service to the steel trade.

Many changes of procedure already have been instituted within the division since the appointment last September of HOWARD V. CLARK as general manager of the order division for the entire company, both Pittsburgh and Chicago districts, and the three new appointments constitute a further step in the general program of reorganization which has been initiated.

Mr. Smith, who has been connected with the company since 1895, has been manager of the production bureau, Pittsburgh district, since 1932.

Mr. Walker, who entered the company as a sales student in 1924, was assistant manager of the service bureau, order division, Pittsburgh district, prior to his present appointment. Mr. Weldin, who has a record of 30 years of continuous service in the company, has been manager of the service bureau, order division, Pittsburgh district, since 1935.

* * *

DENNIS A. MERRIMAN, vice-president, director and general sales manager of the American Steel & Wire Co., and a member of the advisory board of the American Hardware Manufacturers' Association, was presented with a gold medal and a scroll at the 51st annual banquet of the Hardware Merchants and Manufacturers' Association of Philadelphia. These honors are given annually to the outstanding individual connected with the hardware industry who by his activities has reflected credit upon the industry.

"ROATABINS"



ROATABINS WITH SHELVING

Do You Need Space in your Stock Rooms or Tool Cribs?

PIONEERS

In the development—design—manufacture and installation of sectional rotating steel storage bins and shelving.

WE SURVEY

Your storerooms and tool cribs.

WE STUDY

Your line production and bench assembly groups.

WE DESIGN

Your requirements and submit plans for your consideration.

WE SUPERVISE

Equipment to meet your needs.

WE SAVE

The rearrangement of your bins and the installation of our equipment.

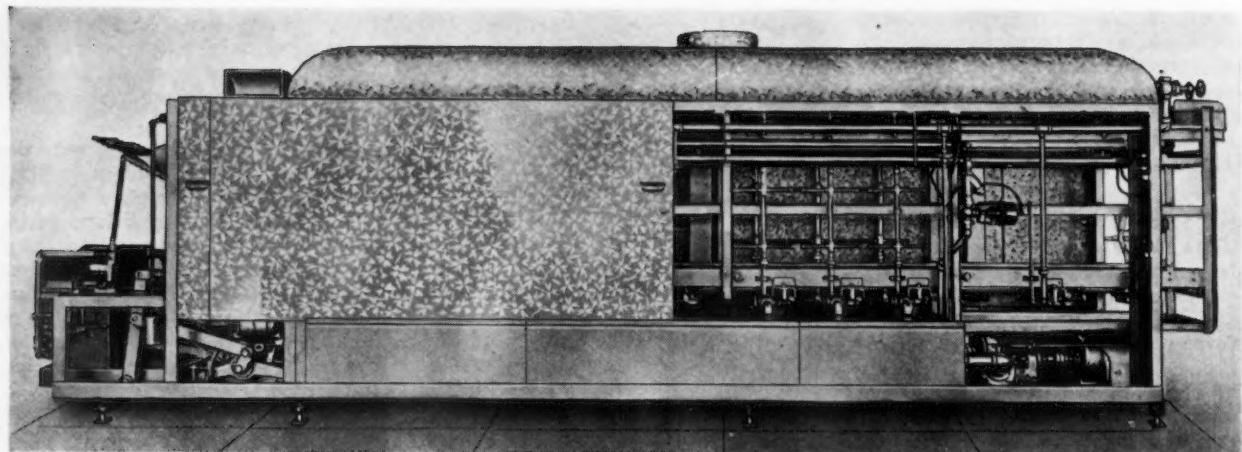
WE SAVE

You *time-labor* and an average saving of 50% *floor space* in stowing all binable material.

Write us for information without obligation

THE FRICK-GALLAGHER MFG. CO.

WELLSTON OHIO



THIS machine cleanses milk cans by successive steps of cold and hot water, hot soda, steam sterilization and hot air.

Rust Proofing Iron and Steel

(CONCLUDED FROM PAGE 54-H)

members, as well as numerous cross pieces can readily be metallized in about 30 min.

An idea of the service expected

of galvanized or metallized parts in a can washing machine may be had by reviewing the various steps necessary thoroughly to wash a milk can. As a can passes into the sheet metal enclosure it is first rinsed with cold water, then cleansed with a soda wash at 150 deg. F. Then follows a 180 deg. water rinse after which comes a

sterilization rinse at 200 deg. Then follows steam sterilization and finally 250 deg. air which dries the can.

All stationary and moving parts of this machine, with the exceptions of pipes and valves, are now metallized and the coating must withstand the working conditions listed above.



HAND STAMP
PAT. PEND.

THIS NEWLY DESIGNED HAND STAMP INCORPORATING ONE OF THE PROVEN MECHANICAL POWERS ASSURES EASE IN THE TOUGHEST OF STAMPING WORK WITH PERFECT SAFETY TO THE OPERATOR.

(WRITE FOR DETAILED INFORMATION)

SAFETY WEDGE GRIP STAMPS AND HOLDERS WILL NOT MUSHROOM WILL NOT SPALL



SAFETY LETTERS & FIGURES



INTERCHANGEABLE HOLDER
PAT. PEND.

THIS HOLDER HAS KNURLED SIDES FOR POSITIVE GRIPPING AND CONTAINS THE SAFETY SNAP QUICK CHANGING UNIT WHICH IS OPENED AND CLOSED WITH THE PRESSURE OF A FINGER.

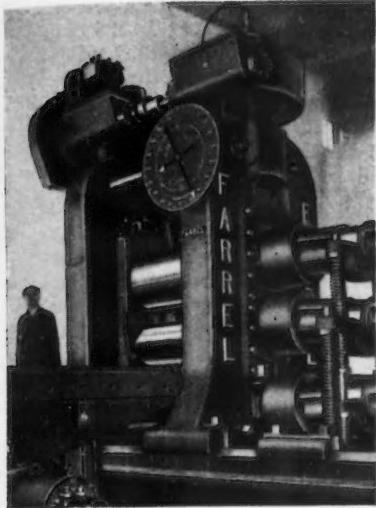
(WRITE FOR DETAILED INFORMATION)

M. E. CUNNINGHAM CO. -

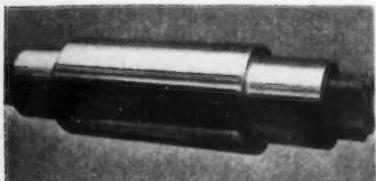
**117 EAST CARSON STREET
PITTSBURGH, PENNA.**

EASING THE BURDEN of the PAYROLL TAX

The Job Ahead for Improved Methods and Machinery



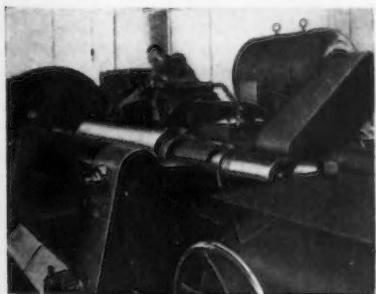
ROLLING MILLS—For non-ferrous metals, foils and cold strip steel. Complete rod mills from furnace to coilers.



ROLLS—All sizes for various purposes. Chilled Iron, Special Alloy Iron, Steel.



DRIVES AND PINION STANDS



ROLL GRINDING MACHINES

Social Security places upon Steel Rolling Mills a cost burden three times that imposed on the Chemical Industry.

It is nearly double the expense to the Non-Ferrous Metal Industry that it is to the Sugar Industry.

It adds almost twice as much to the payroll cost of the Sheet Metal Working Industry as it does to the Newspaper Publishing Industry.

These inequalities are traceable to a uniform tax levied upon *widely varying* labor costs relative to values added by manufacture.

And they require from the high-wage industries a correspondingly greater improvement in efficiency and productivity if there is not to be a serious decline in the standard of living as well as industrial profits.

That is the job ahead for improved methods and machinery.

Two Alternatives

The only source of wages, present and future alike, are the productive values created by industry. Relative to those values, the heavy industries are seen from this table to pay now the highest wages, and already to distribute to labor a

greater percentage of output values than does the average industry.

If that distribution is to continue while paying the cost of future social security, labor must welcome with industry improved methods and more productive machinery.

Labor and industry must produce more at the present costs per unit, or produce the same output at a cost reduction equal to the payroll tax.

Otherwise, future social security can be bought only at the expense of a lower standard of living now.

Present and future economic security can be had only if productivity per employee is increased. Man alone cannot produce enough even to maintain his present standard of living; with present tools and machines he cannot produce enough to hold what he has and pay the cost of future security.

To do both there must be greatly improved methods and machinery, and greater productivity per worker.

We now know how much more productivity must be had to ease the burden of future security.

And that knowledge defines the job ahead for improved methods and machinery.

PERCENTAGE OF VALUE ADDED BY MANUFACTURE PAID TO AMERICAN LABOR

With the payroll cost burden and the total cost forecast in event of no increase in productive efficiency

	% Payrolls to Value Added*	% of Value Added Taken for Payroll Tax†	Total Wage Cost Without Increased Efficiency
Steel	57.3	2.29	59.6
Shipbuilding	55.1	2.20	57.3
Non-Ferrous Metals	39.4	1.58	41.0
Automobiles	38.7	1.55	40.2
Sheet Metal Working	35.0	1.40	36.4
Paper	34.3	1.37	35.7
Canning	26.4	1.05	27.4
Sugar Refining	21.4	0.85	22.2
Newspaper Publishing	19.9	0.79	20.7
Chemicals	19.0	0.76	19.8

* Average for the industries as reported in the 1933 U. S. Census of Manufactures.

† Tax at 4% of payrolls, to be paid by industry in 1938; in 1937 if the present law is modified to place the burden upon the employer.

FARREL-BIRMINGHAM COMPANY, INC.
100 Main St., Ansonia, Conn.

This advertisement is based upon data contained in booklet, "Economic Pitfalls in the Federal Social Security Act," by Allen W. Rucker and N. W. Pickering, copyrighted and published by Farrel-Birmingham Company, Inc.

**NEW RECORDS FOR PRODUCTION AND PRECISION ARE
MADE ON FARREL-BIRMINGHAM MACHINES.**

Monarch Steel Co. Introduces Speed Treat

SEED Case, a high-sulphur, free-machining, high-strength, case-hardening open-hearth steel, introduced several years ago by Monarch Steel Co., Indianapolis, Ind., has been well received by con-

sumers, because of its unique combination of ductility and high sulphur content, that the same company is now offering similar steel in higher carbon ranges. The new steels, designated as Speed Treat



"Mr. Engineer, here's the answer to your Speed Reduction problems"

If Horsburgh & Scott Speed Reducers could be brought to your desk so that you could examine them, you would quickly recognize these outstanding advantages . . . 1. Ultra-simple in design. 2. Accurately cut gears with heavier, wider faces. 3. Anti-friction bearings. 4. Shafts and bearings oversize. 5. Heavy, ribbed, dust-tight housings. 6. Splash lubrication.

The Horsburgh & Scott line is complete . . . a speed reducer for every industrial purpose . . . each with its definite advantages.

Send for complete catalog.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

X1535 and X1545, contain 0.30 to 0.40 carbon and 0.40 to 0.50 carbon respectively.

The Monarch manufacturing process enables the use of a large amount of sulphur to obtain free machining, but, it is said that this sulphur does not in any way result in customary brittleness. This unusual ductility is demonstrated by the manner in which a cold-drawn 1-in. bar of Speed Treat X1535 can be tied into a knot and pulled tight, yet with no sign of fracture. Another demonstration of unusual ductility is shown in the lower view; the bar was bored out and then flared $\frac{1}{8}$ in. larger than the original diameter.

This steel, notwithstanding the 0.25 sulphur and high carbon, has a machineability rating practically equal to 1112 Bessemer. For the most part, the new Speed Treat steels are designed to substitute for conventional steel analyses such as X1335, X1340, SAE 1046 and 1045, on the basis of physical properties, machineability rating and ductility.

Speed Treat steels are said to broach very satisfactorily. As an example, consider the internal clutch casing shown to the right, which has 125 teeth broached clean, sharp and true. The smaller gears also are broached—note the bright, clean finish.

Speed Case X1515 is said to have little or no warpage during carburizing. Note the two shafts shown on the right. Both were machined at high speed, case hardened 5 hr. at 1650 deg. F., cooled in box, re-heated to 1625 deg. F. and quenched in oil for core strength. Reheated to 1425 deg. F. and quenched in water for case hardness.

Conventions

Feb. 15 to 19—National Electrical Manufacturers Association, Waldorf-Astoria Hotel, New York. W. J. Donald, 155 East 44th Street, New York, managing director.

Feb. 15 to 18—American Institute of Mining and Metallurgical Engineers, Engineering Societies Building, New York. A. B. Parsons, 29 West 39th Street, New York, secretary.

Feb. 25—Association of Iron and Steel Engineers, Ohio Hotel, Youngstown. Brent Wiley, 1010 Empire Building, Pittsburgh, managing director.

Feb. 25 and 26—Southern Foundry Conference, Hotel Tutwiler, Birmingham, Ala. L. N. Shannon, Stockham Pipe Fittings Co., Birmingham, chairman.



...OBITUARY...

JOSEPH J. WORKER, former general manager of Calumet Steel Co.'s plant at South Chicago, and at one time superintendent of the Silvan Steel Co., Moline, Ill., died Feb. 2 at Rock Island, Ill.

* * *

ARTHUR J. BAZELEY, who had been engaged in the design and development of railroad equipment for the National Malleable & Steel Castings Co., Cleveland, since 1917, died Jan. 30, aged 64 years. From 1904 to 1917 he had charge of the company's pattern production. He is credited with being the chief designer of the automatic car coupler now generally used and recently developed a new coupling system for high-speed streamlined trains.

* * *

CHARLES E. STUART, for a number of years prominently identified with the steel industry in northern Ohio, died at his home in Massillon, Ohio, Feb. 6, aged 58 years. He was president of the Central-Alloy Steel Corp., Massillon, before the merger that made it part of the Republic Steel Corp. Later he was president of the Tyson Roller Bearing Co., Massillon, retiring from that company about three years ago.

* * *

WILLIAM E. DAVIS, president and chairman of the board of Denman & Davis, North Bergen, N. J., dealer in iron and steel, died at his home in Maplewood, N. J., on Feb. 1, aged 73 years. He had been identified with the steel business for many years, having been formerly an agent for Benjamin Atha & Co., later the Crucible Steel Co. of America. He retired from active business four years ago.

* * *

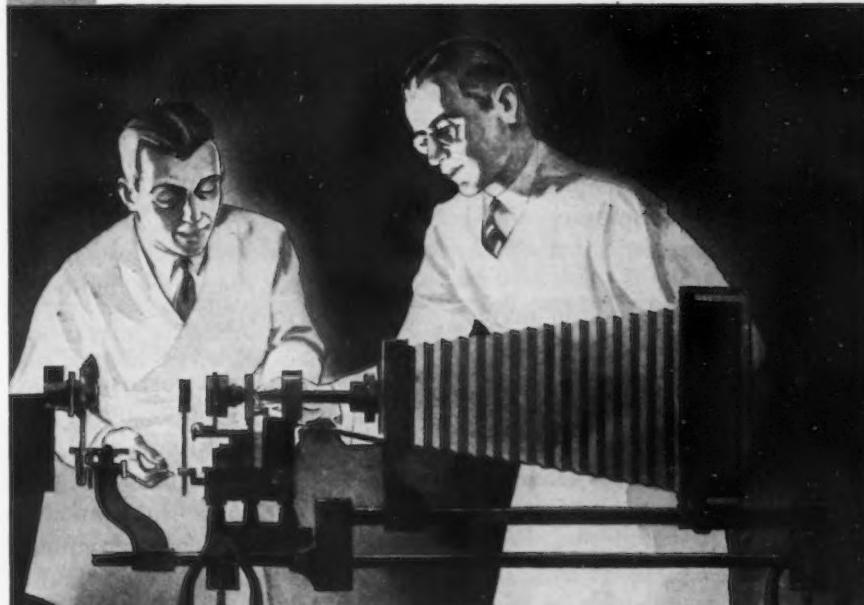
HENRY GILES, general superintendent of the Carnegie-Illinois Steel Corp.'s wood works in McKeesport, Pa., died Feb. 7, aged 46 years. A graduate of Rensselaer Polytechnic Institute, class of 1911, Mr. Giles had been employed since 1917 by the American Sheet & Tin Plate Co., which was recently absorbed by the Carnegie-Illinois Corp. He worked as construction engineer in Gary, Ind., assistant manager American works in Elwood, Ind., and assistant manager of the national works in Monessen. He was transferred in 1933 to McKeesport as assistant manager of the wood works and made superintendent the following year.

Bids on U. S. Drydock Exceed Appropriation

WASHINGTON, Feb. 9.—It is expected that the Navy Department will ask Congress for an increased appropriation over its present available fund of \$750,000 for the construction of a dry dock

for Pearl Harbor, T. H., to berth 1800-ton destroyers because bids opened last week greatly exceeded that sum. The lowest bid, \$11,982,000, was submitted by the Dravo Construction Co., Pittsburgh. The Department is in a similar position with respect to the construction of a huge floating dry dock for Pearl Harbor.

**THOUSANDS of BARS
HUNDREDS of ANALYSES
only one type is best suited
for your requirement**
*Let WYCKOFF
METALLURGISTS HELP YOU
SELECT the RIGHT ONE*



WYCKOFF DRAWN STEEL COMPANY

General Offices: First National Bank Bldg., Pittsburgh, Pa.
Mills at Ambridge, Pa. and Chicago, Ill.
Manufacturers of Carbon and Alloy Steels
Turned and Polished Shafting, Turned and Ground Shafting
Wide Flats up to 12" x 2"

Japan Buys American Continuous Mill

REFLECTING the spread of the American method of continuous steel rolling to Japan, United Engineering & Foundry Co. has received an order through Mitsui & Co., Ltd., of New York, for a new 43-in. continuous hot strip mill to be located in Japan on the island of Kyushu at Shimonoseki, approximately 900 miles southwest of Tokyo.

This mill, of approximately 450,000 tons annual capacity, will be a duplicate of the recently completed hot strip mill of the Carnegie-Illinois Steel Corp. at McDonald, Ohio,

which was built by United Engineering.

The Japanese steel plant at Shimonoseki, which employs 40,000 and makes a wide variety of steel products, will utilize the output of the new continuous mill to the extent of 350,000 tons for sheets, while about 100,000 tons will be used for rolling tin plate by the cold reduction process.

The hot mill will consist of the latest design of slab heating furnaces and necessary mechanical equipment, a two-high roughing train followed by a conventional train of four-high finishing mills at the end of which will be a high-speed flying shear, runout tables, coilers and piling equipment.

In addition to the hot strip mill

equipment, United Engineering has received orders for accessories, including its standard tin plate reciprocating shears, cleaning equipment for tin plate and strip and heavy duty tension reel.

It is planned to put this mill in operation early in 1938.

A recent visit to Japan made by George T. Ladd, president of United Engineering, was a factor which resulted in this Japanese equipment business being placed in the United States, it is believed. Mr. Ladd was honored at a number of ceremonials and functions while in Japan because of the fact that his father had been instrumental in revising the educational system in that country. His father, who had been a professor at Yale University, was invited to Japan for that purpose and a stone shaft was erected in that country after his death as a token of Japanese respect to his memory.

"It ain't in there, Mister."

The Bearded Prophet, the Sooth-Sayer, the Seventh Son of a Seventh Son, can't gaze into the crystal ball and find the answer to your corrosion problems.

Corrosion problems just aren't solved that way. Some are solved by the trial and error method; many of them are solved by the use of Duriron Company acid-resistant equipment.

Of course, we are much in favor of the latter method. But, after all, what difference does it make whether the equipment is called *Duriron*, *Durichlor*, *Durimet*, *Durco Alloy Steels*, or *Alcumite*—so long as it does the job satisfactorily?



You are interested in results . . . in lower costs of maintenance . . . in more trouble-free service from your equipment.

We think we've got something for you for handling acids or acid solutions.

So, if you have a corrosion condition that is troublesome, find out if we can help you any. We shall be glad to work with you. A new catalog, Bulletin No. 1000, will be sent upon request.

Foundry Equipment Association Elects

AT the annual meeting of the Foundry Equipment Manufacturers' Association in Cleveland, new officers were chosen as follows: President, Robert S. Hammond, Whiting Corp., Harvey, Ill.; vice-president, H. S. Hersey of C. O. Bartlett & Snow Co., Cleveland. Arthur J. Tuscany of the Cleveland trade association management firm of Tuscany, Turner & Associates, Penton Building, was re-elected secretary-treasurer. In addition, three directors to replace those whose terms expire were elected. The new directors are Robert S. Hammond, H. S. Hersey (company affiliations given above), and O. A. Pfaff of American Foundry Equipment Co., Mishawaka, Ind.

In addition to the customary committee reports, special attention was given to customer relations for the purpose of defining ways and means through which the equipment manufacturers could render maximum service to the foundry industry. Of prime interest in this field is the convention and exhibit of American Foundrymen's Association to be held in Milwaukee in May.

The Soviet Trade Representation in Japan has opened a permanent exhibit of Russian-built machines in Tokyo. It is claimed that there is no thought of competing with low-priced Japanese equipment, but rather with American, German, Swedish and Swiss machinery.

THE DURIORON COMPANY, Inc.
438 N. Findlay St.

Dayton, Ohio.



DREAMS

that come true

Open Hearth
Screw Steels
SAE 1115
SAE 1120
SAE X-1314
SAE X-1315
SAE X-1330
SAE X-1335
SAE X-1340



WHAT expert operator does not "day dream" of better equipment and materials to work with . . . when he can more easily meet strict specifications for machine parts, and turn out greater production with less effort.

Wishful thinking often leads to improvements, and the visionary ideas of yesterday become the practical realities of today. Many difficult fabricating problems of industry are now being answered by advancements in automatic screw machines, and by the development of High Speed Open Hearth Screw Stock.

B & L Cold Finished Bar Steels in the form of Open Hearth Screw Stock make dreams come true for the modern machine operator. This finely manufactured material is well adapted to the requirements of shop and field. It gives a good balance between a dependable machining character and the proper physical quality of the finished part, particularly in response to surface hardening treatments.

B & L engineers will be pleased to tell you how these specialized steels may be applied to your needs.

Cold Drawn Bars • Ground Shafting • Ultra-Cut Steel • Special Sections • Alloy Steels

BLISS & LAUGHLIN, INC.
HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

This Week on the Assembly Line

(CONTINUED FROM PAGE 59)

per cent higher than in January, 1936. The upward trend in the welfare load which had persisted for several weeks has now been reversed. Flint's welfare load, on the other hand, has trebled in recent weeks.

1936 Record Sales

December sales of 327,303 passenger cars in the United States

skyrocketed 1936 sales to a total of 3,404,407 units, the second best sales year in automotive history and a gain of 24 per cent over sales in 1935. These are Polk figures. At the same time, a gain in 1936 truck sales of 19.8 per cent made 1936 the greatest sales year in truck and commercial car history, with a total of 611,644 units. December

truck sales totaled 42,208, a gain of 40 per cent over November sales and 7½ per cent over December, 1935. The best sales year for passenger cars was 1929, when 3,880,206 cars were sold. Truck sales in 1929 totaled 527,057. Combined, the passenger car and truck sales for 1936 reached 4,016,141.

Rubber to Michigan

Before the year is out, Michigan will become a rather large factor in the manufacture of tires. The Ford Motor Co. is in the process of buying equipment and erecting a building for making tires. Goodyear Tire & Rubber Co. has started the erection of a factory building 150 x 650 ft. on the former site of the Kelsey-Hayes Wheel Co. plant at Jackson, Mich. Goodyear's total investment at Jackson will be about \$3,500,000. It was also announced last week that the Firestone Tire & Rubber Co. had purchased 300 acres of land on the Detroit River just south of Wyandotte and within a few miles of the Great Lakes Steel Co. plant. Negotiations for the property have been under way for the last five months and it is understood that ground will be broken within the next month. Because of the extensive fill-in operations on lowlands along the river, actual building operations will not be started, however, until Aug. 1. Detroit for many years has had the tire-making division of U. S. Rubber Products, Inc., a plant, incidentally, that has been singularly free from labor difficulties despite the troubles at Akron.

What the UAW Wants of General Motors

Below are excerpts from a hypothetical agreement between the Chevrolet Motor Co. and the UAW recently printed in *The Flint Auto Worker*, union publication. While as yet purely hypothetical, this agreement typifies the types of demands that are being made upon the corporation, particularly as to hours, minimum wages of 80c. an hr. for both sexes and seniority based solely on length of service. This last item completely abrogates the basis of seniority established by Dr. Leo Wolman's Automobile Labor Board set up under the President's settlement of 1934, wherein was recognized the Class D man whose services are essential to the operation of the plant, regardless of length of service. Excerpts from the proposed Chevrolet agreement follow:

This agreement made and concluded at Flint, Mich., this..... day of 1937, by and between the Chevrolet Motor Co., Division of General Motors Corp., party

"A.W." "70-90"
SUPER STRENGTH STEEL

**Reduces Weight
With No Loss Of Strength**

Cuts dead weight as much as 40%.

Lends itself readily to difficult cold forming and cold flanging.

Its corrosion resistance is superior to all ordinary steels.

Efficient metallurgical and chemical control is ensured by completely equipped laboratories.

Its weldability is excellent—requires no treatment to prevent brittleness.

— and its cost is low

Write for new literature and call on our Engineering Departments for competent collaboration.

ALAN WOOD STEEL COMPANY
CONSHOHOCKEN, PA.

BRANCHES:

Philadelphia, New York, Boston, Detroit, Los Angeles, San Francisco, Seattle, Houston

111 YEARS' IRON AND STEEL-MAKING EXPERIENCE



of the first part, hereinafter designated as the employer, and the International Union, United Automobile Workers of America, Local Union No. 156, hereinafter designated as the employees through their executive shop committee, witnesseth:

Therefore, the parties agree as follows:

ARTICLE I—RECOGNITION

Section 1. The company agrees to meet with the duly accredited representatives of its employees upon all questions arising between the company and its employees, with a view of adjusting any grievances and complaints which may now exist or which may arise in the future.

ARTICLE II—REPRESENTATION

Section 1. The right to have a shop committee representing the employees is conceded, such committee to be composed of nine members, including the chairman. The method of selection of said committee, its chairman, and spokesman, shall be left to the employees, and the company agrees to negotiate with accredited spokesmen or representatives of the employees.

Section 2. The company agrees that there shall be no discrimination against any of the employees on account of services on said committee.

ARTICLE III—GENERAL WORKING CONDITIONS

Section 1. Any employee who has been discharged or suspended by the company shall not be removed from the payroll until his case has been heard by both parties to this agreement. Such cases shall be first taken up with the superintendent. If an agreement cannot be reached with the superintendent, the case shall be taken up with the general manager. If an employee is judged by mutual agreement not guilty and returned to work he will be compensated for all lost time.

Section 2. The employer shall adopt the 6-hr. day and the five-day work week. . . .

Section 7. All time worked over the regular shift whether before or after the regular starting or quitting time shall be classed as overtime, and compensated at the rate of one and one-half times the regular rate of pay.

Section 8. All legal holidays shall be compensated at the rate of two times the regular rate of pay. . . .

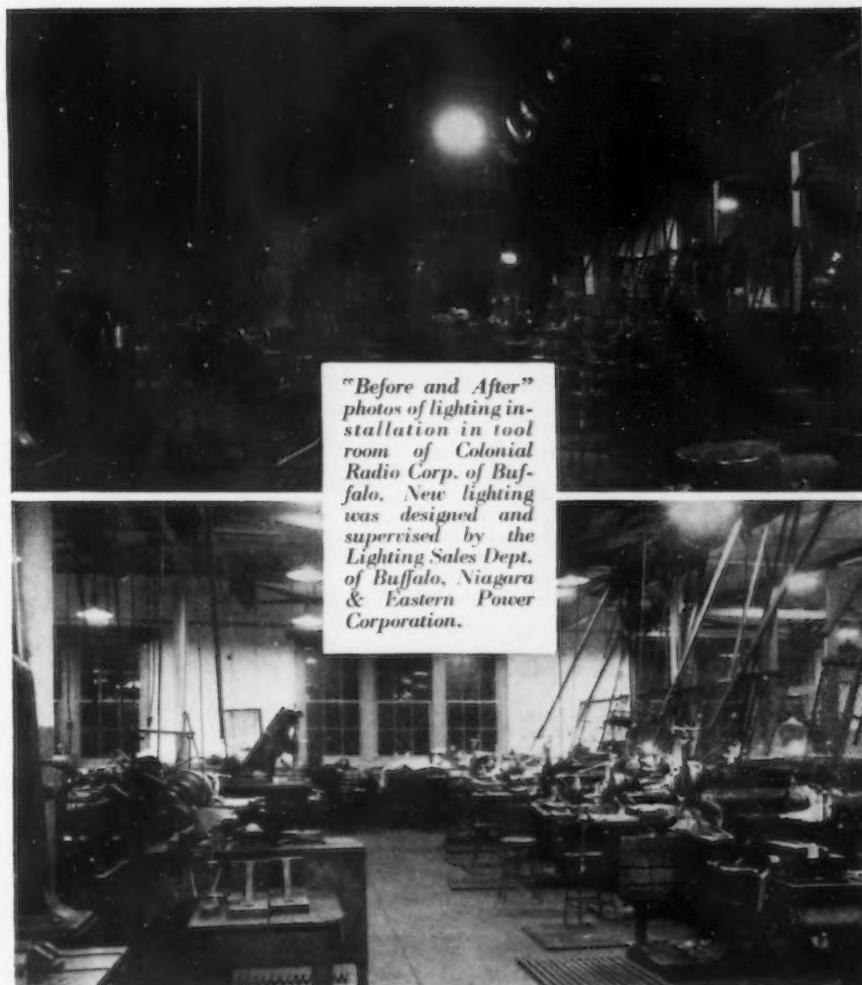
Section 9. The representatives shall be paid for all time on grievance work inside the plant, at the regular hourly rate. . . .

Section 11. The management agrees to the abolition of the piece-work system and a straight hourly rate to be set up as provided for hereinafter.

Section 12. When a decrease in force is necessary because of stabilization of production as a result of break-down, or lack of stock, or any other reason not being the fault of the employee, employee shall receive regular rate of pay.

ARTICLE IV—SENIORITY

Section 1. Seniority shall be established for all employees who are on



"Before and After" photos of lighting installation in tool room of Colonial Radio Corp. of Buffalo. New lighting was designed and supervised by the Lighting Sales Dept. of Buffalo, Niagara & Eastern Power Corporation.

BETTER LIGHTING Speeds work... Improves morale

Before the Colonial Radio Corporation of Buffalo improved their plant lighting, four 100-watt lamp clusters in the tool room provided only three footcandles of light—not enough for efficient, safe seeing.

As an experiment, a better lighting installation using Edison MAZDA lamps was made and the lighting was increased to 20 footcandles. These experimental results were so satisfactory that better lighting was also installed in the press room,

machine shop, and in the company's offices. According to Mr. A. H. Gardner, president of the company, the new lighting installation has helped reduce errors, increased safety, brought more efficient production, and improved the morale of employees.

Ask your local lighting company to measure the lighting in your plant with a Light Meter and to show you how important it is. General Electric Co., Dept. 166, Nela Park, Cleveland, O.

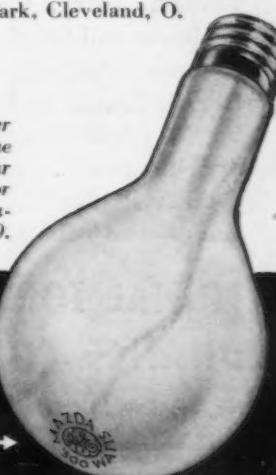


MEASURE LIGHTING WITH NEW G-E LIGHT METER

This new General Electric Light Meter quickly and accurately tells whether the various processes and operations in your factory or shop are sufficiently lighted for safe, efficient seeing. Every plant executive should have one. Costs only \$11.50.

EDISON MAZDA LAMPS GENERAL ELECTRIC

They stay brighter longer →



the payroll of the Chevrolet Motor Co. at the time of the signing of this agreement. Seniority shall be established from the first hiring rate of each employee, providing said employee was not off the payroll through any fault of his or her own. Only an employee who quits voluntarily shall lose his seniority.

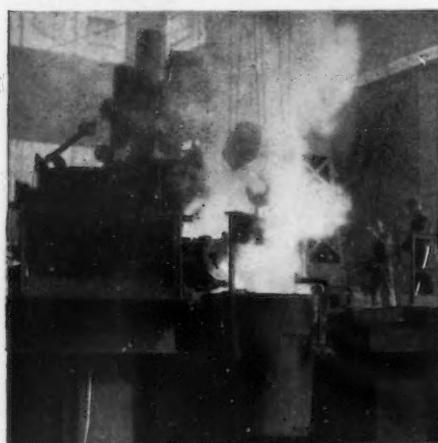
Section 2. Seniority lists, after having been agreed upon, will be submitted to the chief stewards in each division. The committee shall act upon all former employees discharged for union activities.

No foreman or assistant foreman hired as such is to have any seniority rights over productive employees.

Section 3. The company shall give



BASIC ELECTRIC STEEL FORGINGS



N.F. & O. Basic Electric Steel produced under rigid metallurgical control is an important quality factor in the ultimate forged product

BASIC ELECTRIC STEEL

**Carbon, Alloy, Corrosion
Resistant and Special Steels
Smooth Forged, Hollow
Bored, Rough or Finished
Machined, Heat Treated to
Specifications . . . Forging
Quality Ingots, Pressed or
Hammered Billets.**

NATIONAL FORGE AND ORDNANCE COMPANY IRVINE, WARREN COUNTY, PENNA.

five working days' notice to all employees who are to be laid off.

Section 4. When an increase in force is necessary the older employee in point of service shall be called back first.

Section 5. The company agrees to furnish the executive shop committee with the seniority list of all employees on the payroll and to notify the committee of all employees laid off and also recalled to work.

Section 6. Employees' names shall not be removed from the payroll for sickness, accidents, or any other cause, providing they notify the company executive shop committee within five working days.

Section 7. In the event an employee is sent home because of lack of work, or other cause, no employee with less seniority shall be allowed to work on this job except by approval of the committee.

Section 8. The company agrees that length of service only shall determine a man's seniority, with the exception of the executive shop committee, who shall always head the seniority list.

ARTICLE V—WAGES

Section 1. The company agrees to establish minimum wage of 80c. per hr. regardless of sex, color or age.

Section 2. No employee's hourly rate shall be reduced.

Section 3. The committee shall have

the voice in retiming all jobs they deem necessary.

Section 4. All employees shall receive the same compensation as the highest paid employee doing the same kind of work.

Section 5. The company agrees to pay 10 per cent bonus for all night workers.

Section 6. In the event an employee is transferred temporarily in no case is his hourly rate to be reduced.

Section 7. In event a man is transferred to a higher rate of job, this man is to be paid the hourly rate on that job.

Section 8. The hourly rate of each employee is to be established as of the average hourly rate on week ending Dec. 12, 1936. This is to be determined on the amount of money received, divided by the actual number of hours worked. In event the average hourly rate is less than the minimum herein stated, naturally the minimum shall prevail. The shop committee to make an immediate survey throughout the entire plant for the purpose of establishing permanent rates, all raises to be retroactive as of the signing of this agreement.

Section 9. Hours of work to be cut to 24 hr. per week before any employee is laid off.

Section 10. Pay day shall be every Friday on the job, during working hours.

Roosevelt Proposes Large Program Of Construction Over Six Years

WASHINGTON, Feb. 9.—Large tonnages of steel, together with heavy machinery requirements, are involved in the six-year coordinated building program laid before Congress last Wednesday by President Roosevelt. Highways, bridges, flood control work and dams are included in the hundreds of projects contemplated in the plan of Federal construction estimated to cost \$5,011,000,000.

The program would be under the direction of a permanent Public Works Department, which the President has proposed as an additional executive branch of the Government in recommended reorganization. The new department would be in charge of an additional cabinet member. Such a department long has been proposed by engineers of the country.

The huge building program, the President told Congress, has a dual purpose, to "provide for the orderly development of our resources" and to serve as a bulwark against future depressions. Former President Hoover was an advocate of a large public building program to take up the slack of industrial operations

and employment in times of depression.

Under the proposed program projects would be submitted to the Public Works Department, and be subjected to examination by the President. The President then would annually, in his budget message, ask Congress for an appropriation for public works, based on a list of proposed projects.

In a recommendation for a drainage basin study is the proposed outlay of \$500,000 in connection with continuation and expansion of surveys of the flood-ravaged Ohio river basin and the subsequent expenditure of \$85,000,000 on a construction program in the basin over a number of years. The drainage study would call for cooperation between the States and the Federal Government.

The proposed expenditures, on the contemplated projects, aggregating \$5,011,362,237, were divided by fiscal years as follows: First year, \$1,058,568,650; second year, \$891,762,972; third year, \$809,801,895; fourth year, \$760,410,881; fifth year, \$737,084,401; sixth year, \$753,733,438.



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13 oz.*

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THE TOMKINS-JOHNSON CO.

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Jackson, Michigan

Ickes Still Harps On Identical Bids

WASHINGTON, Feb. 9.—Secretary of the Interior Ickes continues to quarrel over the fact that he receives identical bids for steel. Unlike the industry itself, the Secretary insists like bids mean absence of competition. He does not take into account the fact that like bids mean that the steel producer at the point farthest from the point of shipment has to lower his own basing point price to a level of the basing point price nearest the point of delivery if he is to compete.

Last Saturday, Ickes complained of the practice of identical bidding on steel reinforcing bars for the Bartlett dam on Sale River for a Bureau of Reclamation project in Arizona, despite previous threats that identical bidding would be referred to the Department of Justice for investigation. The Sale dam reinforcing bar award was given to the Sheffield Steel Corp., Kansas City, Mo., at \$28,991 because its plant is farther removed from the point of delivery than is the Los Angeles, Calif., plant of Bethlehem Steel Co., which submitted a bid. The Secretary thus continues his policy of awarding contracts to bidders whose plants are farthest removed from the point of delivery in cases where bids are identical. He does so in spite of a ruling made to him last November by Acting Comptroller General Elliott that when bids are identical and there is no violation of the anti-trust laws the successful bidder must be determined by lot. Where the time element is involved Mr. Elliott held award must be made to the bidder closest to the point of delivery.

"I regret that the practice of identical bidding still prevails in some quarters," Mr. Ickes said. "It is noticeable, however, that the occurrence of identical bidding has been less frequent since the rule was adopted that the bidder farthest distant should receive the award in such cases."

Inland Steel to Add 44-in. Strip Mill

INLAND STEEL CO., Chicago, announces plans to extend its Indiana Harbor facilities for rolling narrow widths of strip steel which cannot be produced to the best advantage by its present 76-in. continuous strip mill. This may involve a 44-in. mill, contracts for which are now being negotiated.

SWOC Man Ousted By J. & L. Employees

PITTSBURGH, Feb. 9.—Reflecting strong anti-Lewis feeling, 70 per cent of the constituents of Paul Normile, employee representative at Jones & Laughlin Steel Corp.'s Aliquippa plant, and pro-Lewis adherent, voted to recall him as a member of the plan of employee representation. According to the petition, these workmen who elected Normile as their representative some time ago, ousted him because of "neglect of duty." The action of this group was later approved by a vote of 30 to 3 at a meeting of the general body of employee representatives.

Mr. Normile, despite the fact that he was removed by a petition, signed by 70 per cent of the workers he represented, has appealed to Secretary Perkins to investigate his rights in the company union.

This is the second time within the past two months that employee representatives favorable to the Steel Workers' Organizing Committee drive have been removed from either a chairmanship on an employee committee or from the office of employee representative.

A bitter attack on John L. Lewis and the SWOC was made this week by Ralph H. Martin, Homestead steel worker, in a talk before the Hungry Club, an open-forum group. Mr. Martin, a Carnegie-Illinois employee representative, charged John L. Lewis with being an egomaniac, who visions himself as a Napoleon of industry and politics, and declared that Lewis's plan for seizing control of industry and politics in this country is based upon the same strategy first tried in 1923 by representatives of the Russian Communistic party. He said that Lewis is being supported by some of the same leaders who were active in that movement in 1923, among them being John Brophy, CIO director. According to Martin, Lewis opposed the proposed industrial unions at that time, but since then has become obsessed with the idea of great power which would be in the hands of the man who organized the workers in the large-scale industries.

Martin, who is a member of the Pittsburgh district council, which represents 18 plants of the Carnegie-Illinois Steel Corp., and who is taking an active part in the defense committee which is opposing SWOC activities, said: "When we decide that we need help in protecting our rights against the domination of our employers, we will yell loud enough to be heard down

in Washington. We feel grateful for the protection and support of the Government, but we will resent being coerced into joining the Amalgamated, or any other labor union, against our will. When we feel employee representation is no longer satisfactory, and we need help in getting rid of it, we will ask

for that help from the Labor Board, the Department of Labor, or even President Roosevelt. Until that time comes, all that we ask is to be left alone, secure in our legal and constitutional rights."

Continued full operation is scheduled for all Allegheny Steel Co. plants for at least another month, according to officials of the company. The high level of the Allegheny River did not affect the operations of either the West Leechburg or the Brackenridge plants.



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January Steel Ingot Production All Time Highest for That Month

TONNAGE of steel ingots produced during January was larger than in any previous January in history, according to the monthly report of the American Iron and Steel Institute, showing output of 4,736,697 gross tons of open-hearth and bessemer steel ingots during the month.

Production in January was 7 per cent above the output in the preceding month, 4,431,645 gross tons, and was more than 55 per cent above the January, 1936, production of 3,045,946 gross tons. In January, 1929, the industry produced 4,500,131 gross tons of steel.

Calculation of the tonnage of ingots produced per week during the month appears for the first time in the institute's report for January, replacing former calculations of production per day.

During January, output was calculated at 1,069,232 tons a week, 81.42 per cent of capacity, which compares with 1,002,635 tons a week in December, which was equivalent to 76.55 per cent of capacity. In January, 1936, the industry operated at 52.50 per cent of capacity, producing 687,572 tons of ingots a week.

By producing more than 81 per cent of its capacity during January,

the industry operated at the highest rate since February, 1930, when operations were at 84.47 per cent.

Calculation of the daily production of steel ingots no longer appears as part of the monthly report of open-hearth and bessemer steel ingot production. Instead, calculation of the tonnage produced per week is shown on the accompanying report for January, 1937. Similar calculations of average production per week will be made for succeeding months.

This change was recommended by the statistical committee of the

American Iron and Steel Institute in order to increase the usefulness of the monthly report of steel ingot production. A figure representing the average production of steel per week in a series of months, it is stated, should be more valuable than a calculation of average production per day to those who use the weekly indices published by other industries, such as carloading reports, kilowatt hours of electrical power consumed, etc.

A tabulation of the production of open-hearth and bessemer steel ingots in each month from January, 1926, through December, 1936, together with the average production per week in each month, has been made. Copies may be obtained by writing to the American Iron and Steel Institute, 350 Fifth Avenue, New York.

13,000 Visit New Westinghouse Plant

MORE than 13,000 citizens from Mansfield, Ohio, and surrounding territory attended the recent Family Day observance and the dedication of the new \$1,000,000 warehouse and office building at the Mansfield plant of the Westinghouse Electric & Mfg. Co. Owing to the recent completion of the huge new building, the regular feature of Westinghouse Family Day

and the dedication of the building were held as a joint activity.

Many who attended the celebration remarked at the growth and changes the addition of this new building has made in the Westinghouse plant at Mansfield. From 100,000 sq. ft. of floor space spreading over several blocks, from 100 employees to more than 4000, or one-third of the city's total employment, from the manufacture of three appliances to the production of a long list of them—this, in brief, recalled the growth of Westinghouse in its 19 years in Mansfield.

The seven-story high triangular edifice is regarded as an outstanding example of modern industrial construction. It is also regarded as one of the largest buildings of its kind in which the steel framework is welded, not riveted. Another unique feature in construction was the method of procedure. The building was begun at the northeast corner of the triangle and erected toward the railroad tracks, which border the southwest side, in order that work could progress toward the supply base on the siding.

One of the interesting sidelights that was recalled at the building's dedication was that in spite of the fact that the building was constructed and ready for occupancy in the record time of six months, that schedule was not marred by any accidents. This record was maintained in the face of working nights under lights, through bad weather "breaks" and other deterrent factors.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS

(Reported by Companies Which In 1935 Made 98.03 Per Cent of the Open-Hearth and 100 Per Cent of the Bessemer Ingot Production)

	Reported Production (Gross Tons)		Calculated			Per Cent of Capacity
	Open- Hearth	Bessemer	Monthly	Weekly	Number of Weeks	
1936						
January	2,793,421	196,389	3,045,946	687,572	4.43	52.50
February	2,707,562	202,445	2,964,418	716,043	4.14	54.67
March	3,095,375	185,040	3,342,619	754,542	4.43	57.61
1st Quarter	8,596,358	583,874	9,352,983	719,460	13.00	54.93
April	3,565,821	304,775	3,942,254	918,940	4.29	70.16
May	3,670,401	302,092	4,046,253	913,375	4.43	69.73
June	3,578,044	334,897	3,984,845	928,868	4.29	70.92
2nd Quarter	10,814,266	941,764	11,973,352	920,319	13.01	70.26
1st 6 Months ..	19,410,624	1,525,638	21,326,335	819,928	26.01	62.60
July	3,525,281	326,606	3,922,731	887,496	4.42	67.76
August	3,768,832	350,560	4,195,130	946,982	4.43	72.30
September	3,782,056	303,048	4,161,108	972,221	4.28	74.23
3rd Quarter ...	11,076,169	980,214	12,278,969	935,184	13.13	71.40
1st 9 Months ...	30,486,793	2,505,852	33,605,304	858,592	39.14	65.55
October	4,144,013	317,710	4,545,001	1,025,960	4.43	78.33
November	3,928,904	329,553	4,337,412	1,011,052	4.29	77.19
December	4,045,746	304,596	4,431,645	1,002,635	4.42	76.55
4th Quarter ...	12,118,663	951,859	13,314,058	1,013,246	13.14	77.36
Total Year	42,605,456	3,457,711	46,919,362	897,463	52.28	68.52
1937						
January	4,357,338	291,794	4,736,697	1,069,232	4.43	81.42

January Pig Iron Daily

Output Up 3 Per Cent

ON the basis of revised returns from companies producing pig iron, actual production of coke pig iron in January was 3,211,500 gross tons, compared with 3,115,037 tons in December. The daily rate last month showed a gain of 3 per cent over that of December, or from 100,485 tons to 103,597 tons.

On Feb. 1, there were 170 furnaces making iron, operating at a rate of 104,060 tons daily, compared with the same number on Jan. 1, producing at the rate of 102,195 tons daily. Furnace changes as given in last week's issue, page 119, remained the same.

The number of available furnaces making coke pig iron has been reduced from 246 to 243 by the dismantling of a Hubbard unit of the Youngstown Sheet & Tube Co., and two Columbus works furnaces, of the American Rolling Mill Co.

Daily Average Production of Coke Pig Iron

	Gross Tons				
	1937	1936	1935	1934	1933
January	103,597	65,351	47,656	39,201	18,348
February	62,886	57,448	45,131	19,798	
March	65,816	57,098	52,243	17,484	
April	80,125	55,449	57,561	20,787	
May	85,432	55,713	65,900	28,621	
June	86,208	51,750	64,338	42,166	
July	74,331	54,138	54,134	24,536	
August	83,686	49,041	39,510	57,821	
September	87,475	56,816	34,012	59,142	
October	91,010	52,216	29,935	50,742	
November	96,512	63,820	30,679	43,754	
December	98,246	68,864	31,898	36,174	
Year	100,485	67,950	33,149	38,131	
	83,658	67,556	43,592	26,199	

Production of Coke Pig Iron and Ferromanganese

	Gross Tons		Ferromanganese†	
	Pig Iron*		1937	1936
January	3,211,500	2,025,885	23,060	24,766
February	1,823,706			24,988
March	2,040,311			22,725
April	2,403,683			19,667
May	2,648,401			18,363
June	2,586,240			17,549
July	13,528,226			128,058
August	2,594,268			20,205
September	2,711,721			20,638
October	2,730,293			15,919
November	2,991,887			19,805
December	2,947,365			24,368
Year	3,115,037			25,715
	30,618,797			254,728

*These totals do not include charcoal pig iron.

†Included in pig iron figures.

Merchant Iron Made, Daily Rate

	Tons				
	1937	1936	1935	1934	1933
January	16,106	10,537	3,926	7,800	2,602
February		11,296	6,288	7,071	2,863
March		10,831	7,089	7,197	2,412
April		13,897	8,799	5,838	1,908
May		12,814	8,441	9,099	3,129
June		14,209	7,874	9,499	4,088
July		11,619	8,644	7,880	6,783
August		12,148	8,194	6,043	7,756
September		12,526	10,090	4,986	10,034
October		13,645	11,199	5,765	8,634
November		14,739	12,503	6,610	7,639
December		14,852	13,312	4,399	8,358

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		February 1		January 1	
	January (31 Days)	December (31 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
New York:						
Buffalo	227,302	224,063	12	7,330	12	7,230
Other New York and Mass.	5,814	5,614	1	190	1	180
Pennsylvania:						
Lehigh Valley	73,107	70,073	5	2,065	6	2,575
Schuylkill Valley	39,020	26,347	3	1,260	3	1,280
Susquehanna and Lebanon Valleys	25,177	25,242	1	810	1	815
Ferromanganese			0	0	0	0
Pittsburgh District	755,018	721,406	36	24,355	*36	*23,365
Ferro. and Spiegel	9,367	13,405		360	*2	*325
Shenango Valley	70,646	62,973	4	2,280	4	2,030
Western Pennsylvania	106,230	95,322	6	3,425	6	3,100
Ferro. and Spiegel	12,730	12,310		410	2	395
Maryland	135,837	129,009		4,380	5	4,160
Wheeling District	128,946	130,365	7	4,645	7	4,650
Ohio:						
Mahoning Valley	313,904	302,095	15	10,360	14	9,745
Central and Northern	263,222	258,673	14	8,490	14	8,775
Southern	42,511	53,146	4	1,615	4	1,715
Illinois and Indiana	647,156	627,082	28	20,875	28	20,455
Michigan and Minnesota	91,860	98,009	6	2,965	6	3,160
Colorado, Missouri and Utah	43,789	40,091	3	1,415	3	1,365
The South:						
Virginia			0	0	0	0
Ferromanganese	966		1	55	0	0
Kentucky	8,900	18,879	0	0	1	395
Alabama	209,998	200,933	15	6,775	15	6,480
Tennessee			0	0	0	0
Total	3,211,500	3,115,037	170	104,060	170	102,195

*Revised.

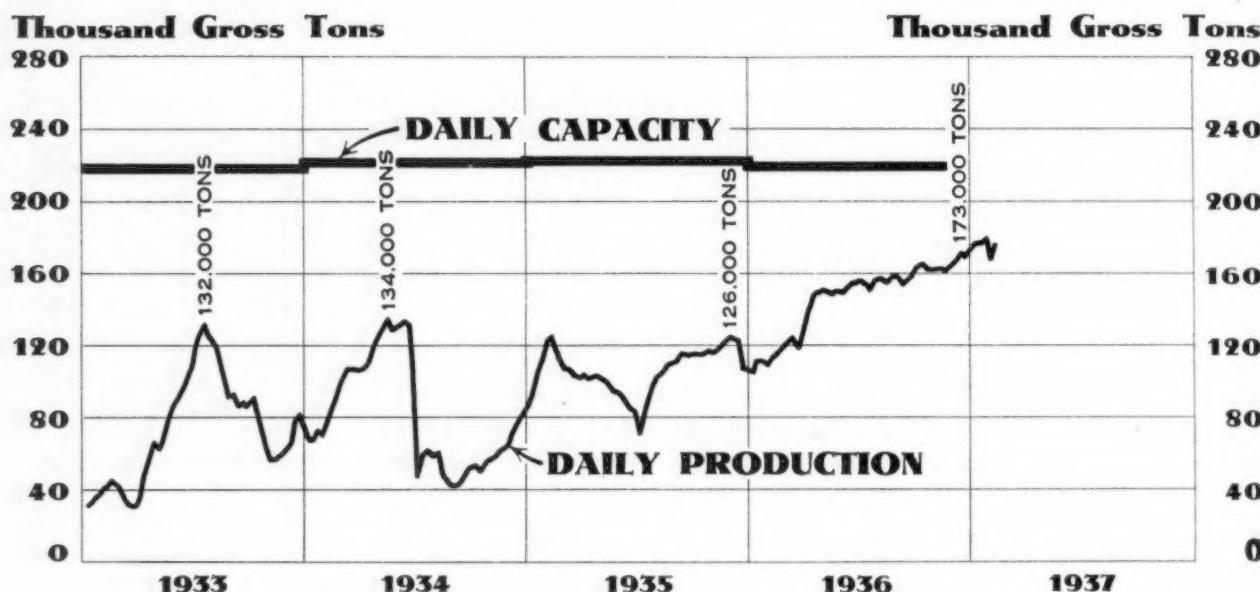
Supported Furnace Wall by Reintjes

AFTER numerous trial installations have proved successful, a new type of supported furnace wall and arch construction has just been publicly announced by the George P. Reintjes Co., Kansas City, Mo. The design of the supported furnace wall was developed with the following principles in mind: The wall is sectionalized, each section being built totally independent of any other section; the weight of all the refractories is transferred to a supporting steel frame work; the wall is designed in such manner that all of the supporting metal is entirely in the back of the refractory, where it can be cooled by circulating air; the joints are broken so as to prevent infiltration of air into the furnace; the spacing of the refractory belts can be varied simply by increasing or decreasing the number of courses of standard fire brick; and this flexibility results in a reduction of the number of casting and tile shapes required.

STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1933-1937

Current Week	Last Week	Feb. 8, 1936	Feb. 9, 1935	Feb. 10, 1934	Feb. 11, 1933
Weeks Ended					
180,397	175,943	116,321	118,439	90,278	45,502



Figures for the current week are not indicated on the chart until the following week.

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week	Weeks Ended		
			Jan. 9, 1937	Feb. 8, 1936	Feb. 9, 1935
Pittsburgh	83.0	82.0	79.0	36.0	45.0
Chicago	80.0	78.5	77.0	59.0	67.0
Valleys	79.0	78.0	73.0	60.0	61.0
Philadelphia	56.5	56.5	56.5	40.0	36.0
Cleveland	78.0	79.0	79.0	64.0	69.0
Buffalo	84.0	81.0	82.0	28.0	46.0
Wheeling	98.0	95.0	95.0	74.0	95.0
Southern	74.5	74.5	69.5	62.0	29.0
Ohio River	19.0	19.0	95.5	79.0	95.0
Western	91.5	91.5	91.5	40.0	45.0
St. Louis	82.0	78.0	75.0	72.0	33.0
Detroit	93.0	93.0	100.0	100.0	100.0
Eastern	90.0	95.0	95.0	40.0	45.0
Aggregate	81.0	79.0	79.5	52.0	56.5
Average Year to Date	79.2	78.8	79.5	50.7	50.3

Weekly Booking of Construction Steel

FROM THE IRON AGE

	Week Ended				Year to Date	
	Feb. 9, 1937	Feb. 2, 1937	Jan. 12, 1937	Feb. 11, 1936	1937	1936
Fabricated structural steel awards.....	25,530	18,910	30,025	19,650	165,665	117,550
Fabricated plate awards.....	7,575	4,175	3,680	7,835	23,590	53,860
Steel sheet piling awards.....	1,580	4,800	2,200	2,760	10,530	6,360
Reinforcing bar awards.....	4,385	4,030	6,345	3,260	18,635	59,195
Total Lettings of Construction Steel...	39,170	31,915	42,250	33,505	218,420	246,965



... .SUMMARY OF THE WEEK. . .

... **Steel production up to 81 per cent on top of record-breaking January.**

• • •

... **New demand active and backlogs assure continued high rate for some time.**

• • •

... **Possible future course of labor agitation is chief blot on prospects.**

STEEL ingot production for the country as a whole has moved up to an estimated 81 per cent of capacity this week on top of a January output that was an all-time record for that month and only 10 per cent less than the peak figure of 5,273,167 gross tons of open-hearth and bessemer steel in May, 1929. Last month's total was 4,736,697 tons (81.42 per cent of capacity), which was 55 per cent above that of January, 1936, and equal to 55,600,000 tons on a yearly basis, against 54,312,279 tons of open-hearth and bessemer ingots produced in 1929.

That present high steel production can be maintained in the face of continuance of the General Motors strike and the fact that southern Ohio plants, with nearly 5 per cent of the country's capacity, have not sufficiently recovered from the flood to get above an average operation of 19 per cent, points to a still higher rate when the strike has been settled and flood-stricken mills have resumed.

Barring a soft coal miners' strike on or about April 1 and possible labor troubles in steel plants, major steel companies do not doubt their ability to maintain approximately present output through the remainder of the first half. There is no doubt whatever as to the first quarter, as present backlogs assure production of all the steel that shortages of raw materials, particularly pig iron, coke and raw steel, will permit. There will be a considerable carryover of tonnage into the second quarter, with sheets now being sold for delivery in the middle of that period, and recent bookings of rails, construction material and steel for railroad equipment will also extend into the second quarter for delivery.

NEW business this month has been coming in at a good rate, some mills having booked more tonnage than in the corresponding period of January. Pressure for deliveries is insistent. To some extent consumers and jobbers may be

trying to protect themselves against the effect of further labor disturbances, but consumption is so heavy that no large stocks are being built up. Steel companies are fortifying themselves against a miners' strike by laying in large stocks of coal, and steel production probably would not suffer seriously unless there were a strike of long duration.

The untenable position of John L. Lewis in the General Motors situation, in holding out uncompromisingly for exclusive-bargaining rights for the CIO, together with the failure of Michigan State authorities to enforce the order of the court against sit-down strikers and the sympathetic attitude of the Federal administration toward the labor group, has created nervous apprehension in industry as to the possible future course of labor agitation.

HIGH spots of the week include rush orders from jobbers and consumers in flood-stricken areas to replace damaged stocks; resumption of buying on a fairly large scale by Pacific Coast steel users, following settlement of the maritime strike; additions of about 25,000 tons to recent large structural steel awards, with approximately the same amount out for bids, including 8000 tons for the Thousand Islands International bridge over the St. Lawrence River; and advance in tin plate production to 97 per cent; a prospective stepping up of rail output to meet needs of railroads for spring work; a firmer scrap market, and a large increase in export inquiries, on which some mills have declined to quote.

The world shortage of pig iron is illustrated by an inquiry for 100,000 tons for Great Britain, following recent large purchases by Japan. Steel companies have no iron to spare and merchant furnaces that are not now in blast are confronted by shortage of coke and ore.

INTEREST among buyers is keen as to second quarter prices, but steel companies have little or no information to give. It is doubted that any general advance will occur, but wire products, pipe and some coated products (not including tin plate) may be advanced. There is also talk among some pig iron producers of an increase of \$1 a ton, based partly on higher scrap prices, which causes foundries to turn to larger use of pig iron in their mixtures, but also on a prospective advance in ore prices.

Scrap prices tend upward without much consumer buying. An advance of 25c. a ton on heavy melting steel at Pittsburgh raises THE IRON AGE composite price to \$19, highest since Jan. 27, 1925.



*... District operating rate up to 83 per cent and
Wheeling area is at 98 per cent.*

• • •

*... No let-up in sheet buying, and orders generally
are in good volume.*

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*... Industrial coal being stocked in anticipation of
labor troubles; steel scrap up 25c.*

PITTSBURGH, Feb. 9.—Still faced with tremendous backlogs and innumerable production and shipping difficulties, producers in this district as a whole have increased ingot operations one point to 83 per cent of capacity. Likewise, an attempt to overcome production lost during the flood, has caused steel operations in the Wheeling district to move up three points to 98 per cent of capacity.

New business is about on a par with a week ago. Hot rolled and cold drawn bar specifications have been lighter, but heavy structural and plate bookings showed an increase owing to building construction and car building programs. Further support of present operating levels has come from the steady and consistent demand for tubular goods, and there has been some pick up wire specifications.

A significant factor at this time is the heavy movement of pipe, plates, and shapes, bars and strip, to Pacific Coast ports following the termination of the maritime strike. While a fair proportion of this material had been fabricated awaiting shipment, rolling of much of it was postponed due to heavy pressure from other sources.

It is now perfectly clear that hold-ups from automobile companies affected by labor tie-ups, served as a breathing spell for practically all producers in this district. Some mills have been affected by these suspensions, but in the aggregate their influence toward lowering operating rates has been negligible.

Meanwhile, there has been no let-up in new sheet business and some orders have already been taken for second quarter delivery,

subject to prices then in effect. Tin plate operations are up slightly to 97 per cent of capacity, with incoming business in good volume.

Raw material markets are strong, and considerable stocking of industrial coal is taking place in anticipation of labor troubles on April 1. Reflecting a firmer scrap market, No. 1 steel is up 25c. a ton.

Pig Iron

New business continues light, but some customers are inclined to order in larger quantities than has been the case. Producers are not outdoing themselves in soliciting new business, as their production and shipments are at a high level with little chance of building up inventories. Any forward movement in buying later on in the quarter will gain its impetus from a supply standpoint rather than fear of higher prices.

Semi-Finished Steel

The consistent demand for semi-finished material is almost more than producers can handle. Specifications for sheet bars, skelp, wire rods and forging billets are flowing in freely. Of interest also is the excellent showing made by foreign demand. There is no doubt that heavy raw steel requirements, both for integrated and non-integrated mills, are presenting some knotty problems to steel-making departments.

Bolts, Nuts and Rivets

New orders and releases from automobile companies, other than those affected by shut-downs, have shown improvement within the past week. Initial orders from car

builders have been trickling in and, with the known car backlog, this particular source will be specifying exceptionally heavily during the next several months. Another bright spot in the picture is the distinct probability of additional railroad car repair programs. Meanwhile, miscellaneous business is holding up well and some further support for this classification will be forthcoming as soon as the extent of damage in flooded territories is known.

Bars

Settlement of the maritime strike is reflected in the movement of substantial tonnages to the Pacific Coast. While much of this material had been fabricated awaiting shipment, there is still a large part of it yet to be rolled. Lifting of Pacific Coast suspensions will make up for the slight falling off in new business. No small amount of tonnage is expected to emanate from flooded areas within the near future. The wide diversification of sizes and grades now on the books has prevented any undue reduction of backlog. Orders being received are coming largely from industrial machinery manufacturers, farm implement makers and jobbers. On the whole, present production and shipping conditions are comparable to those in effect in 1929. There has been no let-up in pressure for deliveries and there is yet no evidence that the largest portion of material moving from the mills is not going into immediate consumption.

Cold-Finished Bars

Bookings are unchanged from a week ago. Some sizes are now being promised in four weeks, yet an average would place backlog at closer to six weeks. Production difficulties in some cases are being encountered in getting out the myriad of sizes and shapes placed on the books, and are in some measure responsible for the inability of producers to make much of a reduction in unfilled tonnage.

Reinforcing Bars

Of the 1400 tons of bars going into the Albemarle bridge project No. 116, Hall Hodges, Inc., will furnish 600 tons for Tidewater Construction Co. Bethlehem Steel Co. will supply 800 tons for Virginia Steel Co., which represents T. A. Loving's share of the project. Awards will probably be let soon on 2200 tons of bars to be used in the construction of a pumping station and grit chambers, Detroit. Bids are in on 1350 tons for the north tube of the mid town tunnel, New York. Producers have their hands full in getting out ton-

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

	Feb. 9, 1937	Feb. 2, 1937	Jan. 12, 1937	Feb. 11, 1936
Per Gross Ton:				
Rails, heavy, at mill.....	\$39.00	\$39.00	\$39.00	\$36.37½
Light rails, Pittsburgh.....	38.00	38.00	38.00	35.00
Rerolling billets, Pittsburgh.	34.00	34.00	34.00	29.00
Sheet bars, Pittsburgh.....	34.00	34.00	34.00	30.00
Slabs, Pittsburgh.....	34.00	34.00	34.00	29.00
Forging billets, Pittsburgh..	40.00	40.00	40.00	35.00
Wire rods, Nos. 4 and 5, Pgh.	43.00	43.00	43.00	40.00
Skelp, grvd. steel, P'gh., lb..	Cents 1.80	Cents 1.80	Cents 1.80	Cents 1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	2.20	2.20	2.20	1.85
Bars, Chicago.....	2.25	2.25	2.25	1.90
Bars, Cleveland.....	2.25	2.25	2.25	1.90
Bars, New York.....	2.55	2.55	2.55	2.20
Plates, Pittsburgh.....	2.05	2.05	2.05	1.80
Plates, Chicago.....	2.10	2.10	2.10	1.85
Plates, New York.....	2.33	2.33	2.33	2.09
Structural shapes, Pittsburgh	2.05	2.05	2.05	1.80
Structural shapes, Chicago..	2.10	2.10	2.10	1.85
Structural shapes, New York	2.305	2.305	2.305	2.06½
Cold-finished bars, Pittsburgh	2.55	2.55	2.55	2.10
Hot-rolled strips, Pittsburgh.	2.15	2.15	2.15	1.85
Cold-rolled strips, Pittsburgh	2.85	2.85	2.85	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.80	2.80	2.80	2.40
Hot-rolled annealed sheets, No. 24, Gary.....	2.90	2.90	2.90	2.50
Sheets, galv., No. 24, P'gh..	3.40	3.40	3.40	3.10
Sheets, galv., No. 24, Gary..	3.50	3.50	3.50	3.20
Hot-rolled sheets, No. 10, Pittsburgh.....	2.15	2.15	2.15	1.85
Hot-rolled sheets, No. 10, Gary.....	2.25	2.25	2.25	1.95
Cold-rolled sheets, No. 20, Pittsburgh.....	3.25	3.25	3.25	2.95
Cold-rolled sheets, No. 20, Gary.....	3.35	3.35	3.35	3.05
Wire nails, Pittsburgh.....	2.25	2.25	2.25	2.40
Wire nails, Chicago dist. mill	2.30	2.30	2.30	2.45
Plain wire, Pittsburgh.....	2.60	2.60	2.60	2.30
Plain wire, Chicago dist. mill	2.65	2.65	2.65	2.35
Barbed wire, galv., P'gh....	2.75	2.75	2.75	2.80
Barbed wire, galv., Chicago dist. mill.....	2.80	2.80	2.80	2.85
Tin plate, 100-lb. box, P'gh.*	\$4.85	\$4.85	\$4.85	\$5.25

* Practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

Feb. 9, 1937	2.330c. a Lb.
One week ago	2.330c.
One month ago	2.330c.
One year ago	2.109c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

HIGH LOW

1937.....	2.330c., Dec. 28; 2.084c., Mar. 10
1936.....	2.130c., Oct. 1; 2.124c., Jan. 8
1935.....	2.199c., April 24; 2.008c., Jan. 2
1934.....	2.015c., Oct. 3; 1.867c., April 18
1933.....	1.977c., Oct. 4; 1.926c., Feb. 2
1932.....	2.037c., Jan. 13; 1.945c., Dec. 29
1931.....	2.273c., Jan. 7; 2.018c., Dec. 9
1930.....	2.317c., April 2; 2.273c., Oct. 29
1929.....	2.286c., Dec. 11; 2.217c., July 17
1928.....	2.402c., Jan. 4; 2.212c., Nov. 1

Pig Iron

\$20.25 a Gross Ton
20.25
20.25
18.84

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

HIGH LOW

\$19.73, Nov. 24; \$18.73, Aug. 11
18.84, Nov. 5; 17.83, May 14
17.90, May 1; 16.90, Jan. 27
16.90, Dec. 5; 13.56, Jan. 3
14.81, Jan. 5; 13.56, Dec. 6
15.90, Jan. 6; 14.79, Dec. 15
18.21, Jan. 7; 15.90, Dec. 16
18.71, May 14; 18.21, Dec. 17
18.59, Nov. 27; 17.04, July 24
19.71, Jan. 4; 17.54, Nov. 1

Steel Scrap

\$19.00 a Gross Ton
18.92
18.17
13.75

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

HIGH LOW

\$17.92, Jan. 4
17.75, Dec. 21; 12.67, June 9
13.42, Dec. 10; 10.33, April 23
13.00, Mar. 13; 9.50, Sept. 25
12.25, Aug. 8; 6.75, Jan. 3
8.50, Jan. 12; 6.43, July 5
11.33, Jan. 6; 8.50, Dec. 29
15.00, Feb. 18; 11.25, Dec. 9
17.58, Jan. 29; 14.08, Dec. 3
16.50, Dec. 31; 13.08, July 2
15.25, Jan. 11; 13.08, Nov. 22

nages on the books owing to tight operating schedules at hot mills.

Steel Sheet Piling

Incoming business includes numerous projects requiring less than 100 tons. Jones & Laughlin Steel Corp. has been awarded a contract for 564 tons of piling for rehabilitation work at Calumet Park, Chicago. Bethlehem Steel Co. and Carnegie-Illinois Steel Corp. will share equally in providing 216 tons of piling for a jetty at Belmar, N. J.

Plates and Sheets

Backlogs on structural plates and shapes continue to increase. Not only have these items received support from an increasingly large amount of privately financed projects, but settlement of the maritime strike has resulted in a substantial movement of steel to the Pacific Coast ports. Although some of this material was manufactured awaiting shipment, a considerable portion is still to be rolled. New orders from the West Coast from miscellaneous sources are being received. Adding to the already huge structural backlog will be the large tonnage of material required in the near future for the construction of the leading interest's new strip sheet mill at Clairton, Pa.

Railroad Business

The Missouri Pacific has ordered 25 caboose cars from the Magor Car Co. and will build 300 stock cars at its own shops. The Erie Railroad is inquiring for 80 milk cars, while Canadian National will soon order 100 70-ton gondolas for Grand Trunk Western. The local rail mill is actively engaged on a large backlog of rails placed some time ago, while car and axle plants are working at practical capacity.

Tin Plate

Total specifications are coming in at a steady rate, with the tonnage evenly divided between general line can goods and packers' requirements. With a fair portion of incoming business requiring prompt shipment, tin plate operations are at approximately 97 per cent. Giving no little support to this operating figure, is the consistent demand from miscellaneous package makers. How long the present high rate of operations can last is problematical, but it can be pointed out that this same perplexing question was present in 1936 when mills operated at an extremely high rate throughout the year despite drought conditions.

Sheets

No let-up in sheet demand is apparent and practically all producers in this district have as much

business as they can possibly ship during the first quarter. In some cases specifications have been placed for second quarter delivery on the basis that the price ruling at that time will be paid. The delivery situation has reached a point hardly ever experienced before. Pressure for shipments is coming from all quarters, and the lifting of suspensions by West Coast customers has not helped matters any. An early settlement of the automobile tie-up would only add to the already mounting worries of producers. Meanwhile, bookings by jobbers, railroad car manufacturers, farm implement makers and miscellaneous sources have been in excellent volume and export demand continues to show improvement.

Strip

Orders are on a par with a week ago, with backlogs running from four to five weeks. The majority of incoming business is emanating from widely diversified sources and represents a good general over-all consumption. In most cases producers have gone ahead with production of material, technically under suspension as a result of automobile labor disturbances. Once this situation is cleared up, a heavy flow of additional orders from this source is expected. Total strip steel business since the first of the year has not been as proportionately great as bookings for other finished products.

Tubular Products

Bookings for standard pipe continue to mount and are closely reflecting the substantial increase in both factory and home building. That this trend will continue is a practical certainty, especially in view of the shortages of homes coming to the forefront throughout the country. There is a possibility that the better specifying of standard pipe may be due to expectation of higher prices, but heavy consumption is furnishing most of the impetus. No change in oil-country goods activity is apparent and both railroad and stationary boiler tube business is showing improvement. There is a healthy demand for miscellaneous line pipe, comprising for the most part projects requiring six, eight, or nine miles of material. The future outlook for line pipe business is good; it is known that several large projects are now being figured upon. Most of these will have to go beyond the "conversational" stage within the next two months if the projects are to be completed in time for fall transmission. Settlement of the maritime strike was a signal for an exceptionally large movement of material to West Coast ports

which has been held up for quite some time.

Wire Products

The wire market presents a healthy tone, with attention of most producers' being placed on the production of material already on the books. Nevertheless, incoming demand both for manufacturers' wire and merchant wire items is in good volume and a fair portion of this total is foreign requirements. Nothing definite has materialized regarding price advances, although it is still the opinion of some that certain merchant wire items will be increased for second quarter delivery. Prices are firm all along the line.

Coal and Coke

Fear of labor disturbances when soft coal contracts expire on April 1 is resulting in anticipatory stocking by industrial concerns. Most coal operators are of the opinion that John L. Lewis is going to try to use their industry as a lever in attempting to unionize the steel industry. His technique would be to tie-up with "captive" mines which supply coal for the steel industry. The outcome of negotiations between coal operators and United Mine Workers officials next week will be watched carefully by all those even remotely concerned. Domestic coke business continues in the doldrums with many producers diverting their standard coke to furnace contracts or spot orders. As has been the case for several months, there is little chance that the supply of blast furnace coke will be any more than current requirements.

Mesta Sells 42-In. Mill to Japan

MESTA MACHINE CO., West Homestead, Pa., has received an order through Mitsubishi & Co. Ltd., New York, for a 42-in. 5-stand tandem cold-reducing mill and two skin pass mills for the production of tin plate. The company will also furnish auxiliary equipment. The cold mills will be similar to those built recently in this country, and it is expected that the total annual capacity for making cold reduced tin plate will run close to 180,000 tons. The entire equipment will be manufactured at Mesta's plant and will be completed early in 1938. This particular order follows the placement this week of a contract for a hot-strip mill with United Engineering & Foundry Co. Both the hot and cold mills will be located at Shimonoseki, Japan, approximately 900 miles southwest of Tokyo.



CHICAGO

... Ingot output increased 1½ points to 80 per cent of district capacity.

• • •

... Speeding up of rail rollings may bring further gain.

• • •

... Flood rehabilitation will call for a variety of products.

CHICAGO, Feb. 9. — Pressure for steel deliveries is so inconsistent that mills have put on more capacity, and the ingot rate now stands at 80 per cent, up 1½ points from a week ago. That the pressure has not reached a dead level is indicated by the fact that arrangements are now being made to speed rail production, which is a necessary move, as the railroads will very shortly be calling for rail tonnages needed for spring track work.

Railroad equipment buying remains an active topic and, while this new business is formulating, car shops are using every means within their power to get more steel. Structural fabricating shops are asking larger shipments, the stimulant being the bulge in bookings taken prior to the end of the price protection period. Steel mills are now getting business from some farm implement manufacturers, who heretofore have not found it necessary to enter the open market on certain common products.

New business developing as a result of the floods is coming slowly, the start having been made in the replacement of water-damaged stocks which are held for resale. Rehabilitation will call for track supplies, fencing, sheets, nails and some of the heavier products for use in large structures, bridges and tanks.

Talk of steel price advances seems to center around those coated products which are being influenced by the higher prices for non-ferrous metals.

Pig Iron

February shipments are exceeding the January rate, and all signs point to a good month. The melt in this area is heavy and some of

the smaller foundries find that they underestimated requirements and are now buying at current quotations. High scrap prices are favoring the use of pig iron and this may be a deciding factor in setting second quarter prices.

Coke

The threat of a coal strike, plus the fact that supplies of coke are tight, is leading many foundries to attempt the unusual by storing foundry coke. Crippled production in the Ohio Valley is putting additional strain on Chicago area producers, who are now carrying a load which approximates their ultimate capacity.

Reinforcing Bars

Plans that are in preparation promise to give added life to this market, which is sagging under reduced shop operations. Prompt deliveries are available for the first time in months. Prices remain ragged. Current inquiries are small and none too numerous. However, distributors are figuring on a number of large projects which may call for a total of 25,000 tons. Lettings this week include 400 tons for a post office at St. Joseph, Mo., 230 tons for a post office at Peoria, Ill., and a small lot for a West Side sewer in Chicago.

Bars

New business and specifications have been reaching mills in such quantities that no improvement in deliveries is noted, despite the fact that strike-bound automobile plants hold their shipments in check. Forgers are the chief sufferers of the automobile situation, but they are far from being in a critical condition because of well-diversified order books. Agricultural implement plants are exerting ex-

treme pressure for steel deliveries and mills report that they are now getting business from some of these sources which have not heretofore been open to them. Machine tool plants are at capacity and road-building machinery shops are heavily engaged in preparing for the spring construction rush.

Cast Iron Pipe

January was a poor month in the cast iron pipe business, but a few inquiries are now coming out and indications point to the early start of late winter buying. Flint, Mich., will open bids Feb. 8 on 1500 tons, and other municipalities are preparing plans. Most sellers have stocks on hand and immediate needs can be cared for promptly. The trade anticipates that Government agencies will buy less cast iron pipe in 1937 than in 1936, and it remains to be seen how far other buying sources will go to make up the deficiency.

Sheets

Such conversation as is now heard concerning higher prices for second quarter seems to center on the coated products, which are subject to additional costs as prices for tin and zinc move upward. Copper as an alloying element may also have a bearing. The fact of the matter is producers are saying nothing about prices—all talk and action being on the part of buyers, who have two problems to face. One of these is price, but equally important is the desire to assure supplies in a market of far-deferred deliveries. It is largely this delivery situation which accounts for the speculative side of the market. Users are crowding all possible tonnage into the first quarter and, for that matter, the second quarter. At any rate, as matters now stand, deliveries on many sheet mill products already extend half way through the second quarter.

Structural Material

Another dam across the Mississippi River and a few bridges account for all the tonnage placed except for a sprinkling of very small orders. The market plainly shows that the price protection period is past and fabricators, though doing better at this time, show some little concern about the future. Releases of structural materials are in larger volume, but average shop operations have not climbed above 75 per cent of capacity.

Plates

Figures in the hands of steel producers show that recent freight car awards total over 9500, for which almost 100,000 tons of steel and 40,000 axles have been ordered. (These figures do not include cars

to be built in railroads' own shops.) New cars placed in service in 1936 totaled about 44,000, and there are now on order 48,500 units. This situation strongly reflects itself in steel shipments to car-building and railroad shops. Standard Oil Co. has placed barges which call for 1050 tons of plates.

Rails

Formal announcement has been made by the Colorado Fuel & Iron Co. that it has taken 15,000 tons of rails for the Burlington. Mills are standing by ready to help railroads which are digging out of the mud in the Ohio and Mississippi valleys. To date very little emergency material has been ordered. Rail mill operations remain steady, though plans are now well shaped to increase production about the middle of this month. This move will be largely a matter of juggling raw materials, but this cannot be avoid-

ed because railroads will soon be calling for needed tonnages for track work.

Wire Products

There is a certain degree of concern among buyers as to the course of prices for the second quarter. This frame of mind is leading to an active market in which speculative tonnages, in addition to actual needs, are pushing deliveries forward. The non-ferrous market seems to be the keystone on which users rest their ideas of higher second quarter quotations. Floods have ruined many stocks and mills are inclined to give preference to such replacement shipments in order that dealers and warehousemen in the flooded areas may not only protect their spring trade, but also place them in position to furnish the needs of rehabilitation. Output ranges from 75 to 80 percent of capacity.

Last week open-hearth operations ranged from 17 to 18 units. This week 17 will be active. Blast furnace operations remain unchanged, with 15 stacks in blast.

The settlement of the Pacific Coast maritime strike is of specific interest to the district. Several thousand tons of cast iron pipe are on pipe plant yards awaiting shipment and lately production has been curtailed to some extent by the strike. Steel shipments were also affected.

Birmingham's second "sit-down" strike occurred last week at the plant of the Birmingham Stove & Range Co. Later union officials persuaded the men to leave the plant. The strike was called just at the time the Alabama Legislature was considering a bill to outlaw "sit-down" strikes and make the men liable for damages. This bill has not yet been acted on. The strike at the Birmingham stove plant was for higher wages.



...New plant jobs show trend away from cities.
• • •

...Ingot production is stepped up.

BUFFALO, Feb. 9.—Producers of steel used in construction of industrial plants note a definite trend toward decentralization of production. A movement of smaller industries away from the larger cities to the smaller localities is apparent and several inquiries have come out during the past few weeks for fabricated structural and reinforcing bars to be used in the erection of plants in small communities of western New York. Fabricating plants are busy with small orders. Prices are holding.

During the past week a Buffalo structural fabricator received a contract to furnish 100 tons of steel for a small plant in Cuba, N. Y., for which bids were taken by the Cuba Chamber of Commerce. A Blasdell, N. Y., tank making concern recently moved from the environs of Buffalo to Perry, N. Y. Other recent removals have been noted.

A Buffalo maker will fabricate 100 tons for an addition to the

Walker Laundry at Niagara Falls, and bids soon will be taken on a new building for the Trico Products Corp., Buffalo, which will require 2000 tons of structural steel and 150 tons of reinforcing bars.

Lackawanna plant of the Bethlehem Steel Co. added the fourth unit in its new No. 3 battery of open hearths to the active list over the week-end, making 26 furnaces in operation. Republic continues with seven; Wickwire-Spencer Steel Co. with two.



...Production is continued at a high level.
• • •

...Outlook for February is considered good.

BIRMINGHAM, Feb. 9.—Back logs and a fair volume of new tonnage are maintaining production and shipment at about the high points of the past several months. In view of the heavy bookings in November and December, current business has been most satisfactory. Some mills are still being pressed for shipments. The outlook for February is good.



...Pig iron inquiry for exports to Europe.
• • •

...New England steel mills operating at capacity.

BOSTON, Feb. 9.—Pig iron buying is still confined to scattered small lots. However, a few foundries are making informal inquiries regarding deliveries beginning late in March and extending into the second quarter, and one furnace is dickered with a European firm about a sizable tonnage. This European firm recently bought a tonnage from the Troy, N. Y., furnace. New England foundries generally are stepping up production, and are busier than they have been since 1928.

The three New England steel mills are operating at capacity and have comfortable backlogs. Electrical equipment manufacturers have sufficient business booked to keep them going strong well into the second quarter, and some departments into the third quarter. The General Motors Co. strike has had little influence on accessory manufacturing operations in Massachusetts.



PHILADELPHIA

... Last week's volume of new buying is being maintained.

... Intense pressure for deliveries reported; practically no stocking of steel is noticed.

... Rate of operations continues at 56½ per cent of capacity.

PHILADELPHIA, Feb. 9.—New business is still being received in good volume. Demand seems to be general, and is apparently for immediate consumption, little steel going into stocks, so far as is known here. The jobber trade is active, and here again inventories are not being built up. Advance buying due to possibilities of labor troubles developing in steel plants has not been noticed here at all. Buyers either are confident their sources of supply will not be affected, or else feel that they will have plenty of time to cover their needs in the event of an interruption.

Thus far, producers here have not felt the effects of the flood or the automobile strike. The one or two mills which have customers engaged in supplying General Motors have had sufficient unfilled orders to enable them to continue undisturbed operations. A considerable amount of steel is being shipped to the Pacific Coast by a district mill now that the seamen's strike there has been settled. About 20 per cent of this company's business, it is estimated, originates in that section of the country.

Although there is talk of second quarter price advances, no definite products are mentioned except nails and pipe. The price of nails, according to one seller, may jump \$3 to \$5 a ton. Pipe is generally believed to be slated for a boost; first, because of the current strong demand; and second, because it was one of the few products not included in the last general price advance.

Operations are unchanged at 56½ per cent of capacity. The volume of incoming business prevents the depletion of backlog, and deliveries are growing worse, with

pressure from buyers for earlier shipment increasing.

The scrap market, for the second consecutive week, held steady and strong, pending additional sales to determine the trend of the market. No. 1 steel remains at \$18.50 per gross ton.

Plates and Sheets

Plates may be obtained in from 2 to 6 weeks and sheets in from 5 to 16 weeks, depending on the grade. Back orders of cold-rolled sheets are temporarily lessened due to hold-orders from automobile companies, and may consequently be secured much sooner than previously. Plate volume is unimpressive, but demand for sheets continues heavy. A number of mills are turning down tonnage for delivery this quarter, and are quoting for the second quarter at whatever prices will then prevail. Some foreign sheet inquiry has been reported from Holland, England and other countries. It is not expected that this request will attract a great deal of attention, however. Some hot-rolled strip may still be obtained late in the quarter, but it is practically impossible to secure cold-rolled either in this or for much of the next period. Stainless sheets and strip are selling fairly well in this area, and long deliveries are quoted.

Pig Iron

Current sales are still light, although shipments are proceeding at a fair rate. Some sellers, however, are of the opinion that inventories are being added to slightly at this time. It is believed that sellers will attempt to establish March 31 as the time by which all tonnage now on the books must be shipped. Stocks are low generally,

and, since practically all of the output is spoken for well in advance, an iron shortage is regarded as imminent.

Structural Shapes and Reinforcing Bars

Local awards were not impressive, the largest being 300 tons for two buildings in Bristol, to Frank M. Weaver. Carnegie-Illinois secured the contract for 130 tons of beams for highway work. Belmont Iron Works was awarded 100 tons for an Atlantic Refining Co. structure at Point Breeze. Contract for about 3000 tons of shapes for the Albemarle Sound bridge in North Carolina went to Bethlehem. The reinforcing bars in this project totaled 1400 tons and were divided 800 tons to Virginia Steel Co., and 600 tons to Hall-Hodges Co. About 2000 tons of bars are due for bids in March for the last of the Philadelphia schools.

Imports

The following iron and steel imports were received here last week: 1658 tons of pig iron from Soviet Russia; 400 tons of pig iron from British India, and 4019 tons of chrome ore from Portuguese Africa.



... Structural fabricators are operating at 70 per cent.

... Stove output slowed up by delayed sheet deliveries.

ST. LOUIS, Feb. 9—Fabricators of structural steel in the St. Louis district are operating, it is estimated, at 70 per cent of capacity, and have a backlog of orders which will keep operations at that point through February. However, new business received in recent weeks has been very light, and no sizable projects are up for bids. Highway commissions are making very few commitments, projects being held in abeyance pending allotments from Washington, which has slowed down bridge and road construction. Reinforcing bar awards have been extremely light, consisting entirely of 5 to 20-ton jobs. Bids will be opened Feb. 13 for two highway bridges in St. Louis County, re-

quiring 275 tons of structural shapes.

Steel plants in the St. Louis area have stepped up their operations to 80 per cent of ingot capacity, with no let-down in sight. Agricultural implement foundries are working at their full capacity. There has been a slight let-up in the production of stoves, because of slow deliveries of sheets. New business in pig iron is light because of previous heavy commitments, but shipments are heavy.



... Railroad equipment orders total \$26,500,000.

• • •

... General business from other sources active.

TORONTO, Feb. 9.—Canadian railroads have awarded orders for some \$26,500,000 worth of rolling stock, according to official announcement. Contracts involving \$20,000,000 were awarded by the Canadian National and \$6,500,000 by the Canadian Pacific. L. A. Peto, vice-president of the Canadian Car & Foundry Co., Montreal, states that his company has received orders from the Canadian Pacific to the value of \$6,500,000 and a similar amount from the Canadian National. The remainder of the \$20,000,000 order is divided among the Eastern Car Co., Trenton, N. S.; National Steel Car Corp., Hamilton, Ont., and the C. N. R. shops at Transcona, Man. This business is said to be sufficient to keep the various plants busy for several months. It is understood that other awards will be made soon for additional rolling stock and rails.

Canadian steel interests report substantial business of a diversified nature from other sources. Demand for sheets has been heavy of late, and producers are said to be running some six weeks behind on deliveries and are not taking contracts past this quarter at current prices. Bars and other lines of steel have been more active. The mining industry continues to show expansion in operations, and there

is an active demand for steel and equipment from this source.

Local blast furnace representatives report steady increase in merchant pig iron sales. Awards now are running around 1500 tons per week, despite the fact that a number of melters have contracted for first quarter requirements. Pig iron production is holding at a high level, with six stacks blowing. Prices are firm and unchanged.

Trading in iron and steel scrap continues heavy with large shipments reported by local dealers to the mills in the Hamilton district. Yard holdings continue to decline with very little material from rural districts.



... CLEVELAND ...

... Finishing mills continue to operate on near-capacity basis.

... Some sellers report new business heavier than in corresponding January period.

... Sheets are being sold in increasing quantities for second quarter shipment.

CLEVELAND, Feb. 9.—Ingots output in the Youngstown district advanced another point this week to 79 per cent of capacity. In the Cleveland-Lorain district there was a one point decline to 78 per cent of capacity.

With good backlog orders for practically all products, finishing mills continue to operate at near capacity. New demand is fairly heavy for sheets, structural shapes and plates. Bars are holding up well in spite of suspensions by some forge shops due to the General Motors strike. Some mills report that their volume of new business is heavier this month than during the corresponding period of January. Automobile plants that are not tied up by the strike are taking heavy shipments of steel and some plants making parts for General Motors cars are placing new orders to build up their stocks in anticipation of a heavy rush as soon as the strike is ended.

Sheets are being sold in increasing quantities for second quarter delivery at the prices prevailing at time of shipment, consumers being anxious to get orders on the mill books to assure deliveries when needed.

Railroad buying is slack. In the construction field grade crossing elimination work handled by the Ohio State Highway Department is becoming more active. Republic Steel Corp. has placed 800 tons of steel piling with the Carnegie-Illinois Steel Corp. for dock work at Buffalo.

Some interest is developing in second quarter prices. While a general advance is not looked for, some items may be revised upward.

sheets in light gages and enameling sheets that are largely produced on hand mills.

Strip Steel

While new business is only moderate, some mills have enough backlog to keep up full operations four to five weeks and others are filled for the quarter. New releases are expected this week from some General Motors units that are supplying parts for automobile plants other than General Motors units.

Bars, Plates and Shapes

Miscellaneous demand for merchant bars continues active. Mills have good backlogs and are gaining very slowly on deliveries, promises being from three to four weeks. New orders are coming from bolt, nut and rivet manufacturers, whose old stocks are being used up. In the construction field, there is a fair volume of business in structural shapes in small lots for industrial buildings and activity is being stimulated by new public work. Plans will be out shortly for the Lorain Avenue grade crossing elimination, Cleveland, which will take 600 tons. Grade crossing elimination work in Akron will take 500 tons of reinforcing bars in addition to 600 tons of structural shapes. Miscellaneous demand for plates from manufacturing industries is very good, and mills have substantial backlogs.

Pig Iron

Shipments are showing a gain over January in spite of suspensions by some motor car foundries and by foundries in the lower Ohio River flood belt. Considerable iron was held up by the floods, but part of this has already been released and the demand from some foundries in centers adjoining the flooded areas has been stimulated. Business from railroads and other consumers has filled the gap caused by the suspension of General Motors orders for malleable castings. Some of the merchant furnaces are shipping more iron than they are making. With nearly all foundries under contract new business is light and orders are for very small lots.

Sheets

Demand continues heavy and several mills that are filled up for the current quarter are now entering orders for the second quarter at the prices that prevail at the time of shipment, although some mills are inclined to avoid making commitments beyond this quarter and are turning down some business. Heavy shipments are being taken by automobile plants and suppliers of parts not affected by the automobile strike and some of the General Motors units now idle are building up stocks to assure a plentiful supply of steel when they resume operations. Second quarter prices probably will be named in two weeks and a change in prices on continuous mill products seems improbable. However, some producers say that increased costs warrant an advance on galvanized and other coated sheets, black

... SAN FRANCISCO...

... Settlement of maritime strike will bring out delayed work.

... Large shipments of steel from East are scheduled.

SAN FRANCISCO, Feb. 8.—With the Pacific Coast maritime strike definitely settled last week, when men returned to work and ships left their docks for the first time in three months, a great increase in steel orders is expected momentarily. Numerous building projects which have been delayed by the strike will go ahead during the next two months. Few projects

have yet been announced, but notable among those which have is the opening of bids Feb. 24 on 1000 tons of reinforcing steel for the San Francisco-Oakland Bay Bridge railway facilities in Oakland. Plans call for a railway yard and an overhead crossing over the Oakland port. Bids will be opened Feb. 25 on 6000 tons of structural shapes for use in Government building construction at Sacramento, Cal.

Structural steel awards for the week aggregated 2534 tons, of which 1275 tons was taken by the Columbia Steel Co. in two projects. One involved 635 tons for construction of six bridges over Santa Clara and Tehachapi rivers for the Southern Pacific Co. and the other called for 640 tons to be used in a grandstand for Santa Anita race-track. Reinforcing bar awards totaled 1795 tons in a number of small jobs. Western Pipe & Steel Co. booked 1000 tons of plates for seven steel tanks to be erected for the Shell Oil Co. in Seattle.

Considerable optimism is evident among both jobbers and steel companies over activity for the remainder of the year. Large shipments of finished steel from Eastern mills are scheduled, but it will be some time before they can be delivered here.



...Steel operations have recovered only slightly.

• • •

...Mills in flood area may resume late this week.

CINCINNATI, Feb. 9.—While the river has receded to normal stages, steel operations have recovered only a few points. The Zanesville unit of American Rolling Mill Co. is in full operation and the Middletown plant, except for the strip mill down for repairs, is running in all departments. It is expected the strip mill will be back in operation by the end of this week. The Ashland unit has not fully recovered from effects of the high waters, and production has been delayed until the latter part of the week. Shipments, however, are going forward from Ashland briskly. The Portsmouth plant of Wheeling Steel Corp. is idle, await-

ing rehabilitation of the Portsmouth area, but workers are trying to restore normal production as soon as possible. The Newport Rolling Mill Co. and the Andrews Steel Co. plants are being rapidly rehabilitated, but operations are still days off.

New business is still brisk. The leading district interest is out of the market for the quarter on hot rolled, hot rolled annealed, long ternes and galvanized steel. Orders can be taken for electrical and enameled sheets.

Steel ingot production is down to about 20 per cent owing to flood difficulties.

Pig iron shipments are moving wherever rail facilities permit, but Southern movement is restricted by high water and rehabilitation following the recent floods. The melt is slowly expanding, but is still below the pre-flood level. Foundries only indirectly affected by the flood are back in full operation, while some of those in the high water area began slow heats the past week. Full foundry production may be effected in one to three weeks.



Boston closed bids Feb. 9 on 100 tons of 4-in.

Southbridge, Mass., has awarded about 7000 ft. to United States Pipe & Foundry Co.

Westerly, R. I., has plans for a water system to cost \$113,000, financing to be arranged through PWA. Weston & Sampson, 14 Beacon Street, Boston, are engineers.

Flint, Mich., opened bids Feb. 8 on 1500 tons.

Oostburg, Wis., closes bids Feb. 18 for new waterworks system to cost about \$65,000.

Milwaukee has placed 169 tons of special castings with Rudisill Foundry Co.; 60 tons of off-set pipes with Filer & Stowell Co., and 250 fire hydrants with Florence Pipe & Foundry Co.

West Bend, Wis., has commissioned Suhr, Berryman, Peterson & Suhr, 130 North Wells Street, Chicago, to make survey for proposed waterworks system estimated to cost \$50,000.

Saukville, Wis., has applied for PWA grant of \$43,875 toward proposed water and sewerage system to cost about \$97,500. Jerry Donohue Engineering Co., Sheboygan, Wis., is in charge.

Williams Bay, Wis., plans water purification plant estimated to cost \$30,000.

Hamburg, Iowa, closes bids March 2 for pipe for water system and other waterworks installation, including pumping machinery and accessories, purification equipment, etc. Northern Engineering Co., Brainerd, Minn., is consulting engineer.

Brookhaven, Miss., asks bids until Feb. 16 for pipe for water system; also for valves and fittings.

Cody, Wyo., plans about 10,000 ft. of 6, 10 and 12-in. for water system; also new filtration plant. Cost about \$55,000. Financing is being arranged through Federal aid. Daniel J. McQuaid, Cooper Building, Denver, is consulting engineer.

Everett, Wash., plans about 20,000 ft. of 28-in. for replacement of present Sultan water line No. 1. S. Granville Paine is city engineer.

Norway, Mich., plans 6-in. pipe for water system; also other waterworks installation. Fund of \$62,650 is being arranged through Federal aid. James Clulo is city engineer.

Tampa, Fla., plans 6 and 12-in. for water system. Fund of \$225,000 is being arranged through Federal aid for this and other waterworks installation.

General Purchasing Officer, Panama Canal, Washington, closes bids Feb. 19 for 4400 ft. of 2 and 4-in. cast iron soil pipe; also for cast iron soil pipe fittings (Schedule 3222).

Elko, Nev., plans pipe lines for water system and other waterworks installation, including elevated steel tank and tower, pumping machinery and accessories. Fund of \$45,000 is being arranged. R. A. Kinne is superintendent of waterworks.

Seminole, Tex., plans pipe lines for water system and other waterworks installation. Cost about \$32,000. H. N. Roberts, 2415 Twentieth Street, Lubbock, Tex., is consulting engineer.

Liberty Center, Ohio, closes bids Feb. 23 for pipe lines for water system and other waterworks equipment. George Champe & Associates, Nicholas Building, Toledo, Ohio, are consulting engineers.

Olean, N. Y., closes bids Feb. 18 for pipe for water system, including fittings. Nicholas S. Hill Associates, 112 East Nineteenth Street, New York, are consulting engineers.

Lodge Grass, Mont., plans 4, 6 and 8-in. for water system; also other waterworks installation. Special election will be held soon to approve bonds for work. Daniel J. McQuaid, Cooper Building, Denver, is consulting engineer.

North Swanzey Water and Fire Pre-cinct, North Swanzey, N. H., will ask bids soon for pipe lines for water system. Bids recently received have been rejected and revised plans are under way. H. B. O'Neil, 25 Roxbury Court, Keene, N. H., is consulting engineer.

Rustless Iron Buys 12-in. Merchant Mill

UNITED ENGINEERING & FOUNDRY CO. has received an order from the Rustless Iron & Steel Co., Baltimore, for a new 12-in. merchant mill of the three-high type, consisting of seven roll stands and three cropping shears. The mill will be driven by a 700-hp. motor.

An especially adaptable mill was required by the Baltimore concern because it will be used for rolling various sections of stainless steel such as rounds, squares, flats, etc. The mill will be completed in time to be placed in operation in May of this year.

H. A. Brassert & Co. are consulting engineers for this plant.



• • • NEW YORK • • •

... Steel buying continues at a good rate; sheets particularly in demand.

• • •
... Price advances for second quarter not likely except on pipe and wire products.

• • •
... Possibility of coal strike April 1 is in minds of buyers.

NEW YORK, Feb. 9—Now that coverages on identified construction projects and railroad equipment orders are out of the way, protection having expired Jan. 30, the steel market has settled down to a normal routine of manufacturers' and jobbers' requirements. In these lines business is proceeding at about the pace of last month. There continues to be a strong demand for sheets, and buyers are doing a good deal of shopping around because of the fact that some mills are out of the market for this quarter, except on cold-rolled sheets, and others are quoting long deliveries, which range from six to eight or ten weeks, depending upon the grade. Some mills cannot ship galvanized sheets in less than eight or 10 weeks. A part of the continued demand for sheets may be ascribed to the fact that some mills in the flood areas have been unable to make shipments. However, the Wheeling area is again able to obtain railroad transportation, which will ameliorate the situation. Pressure for deliveries is strong.

The attention of buyers and sellers is focused on the possibility of labor troubles in the coal and steel industries and the price situation in the second quarter. The announcement by the United Mine Workers that a set of demands affecting wages, hours and working conditions will be presented on or before April 1, brings the fear of a coal strike to the fore. Most of the steel companies have large coal stocks and would not be seriously inconvenienced unless there were a strike of long duration. Opinion as to the possibility of a steel strike

this spring is divided, some holding to the belief that John L. Lewis's Committee for Industrial Organization will not attempt any drastic move before fall, while others fear trouble may occur this spring.

As to steel prices, it is doubted that there will be a general advance for the second quarter. It is understood, however, that some makers of steel pipe, which was not advanced in price when other products went up, are considering a higher price level. The stumbling block to its effectiveness seems to be the resale situation in the New York area, which has been chaotic for several years and does not show signs of real improvement. There is also talk of higher prices on wire products. Otherwise there are no indications that the present price situation will be disturbed.

Pig Iron

An inquiry from England for 100,000 tons was received here last week. While testing of the market by foreign countries indicates a scarcity abroad, prices here are too high to stimulate exports, and business of this nature has so far been relatively unimportant. An additional factor is that the home consumption is active and supplies restricted. Capacity exists for a larger than current output, but cannot be utilized because sufficient coke isn't available. A seller here has discouraged foreign inquiry by quoting a price higher than is demanded of domestic users, and in general producers are disinclined to risk commitments which conceivably might spell privation for

the domestic trade if production cannot be increased as needed. On the strength of shipments, prices are firm. An increase for the second quarter is possible, but present indications point to no contemplated action.

Plates

In view of the fact that the recent wage increases averaged more in cost per ton than is being realized by the recent price boosts, some Eastern plate sellers are of the opinion that the second quarter will bring another advance in prices. Nearly all plate mills are filled for most of this quarter with low-priced tonnage, purchased either in advance or booked as identified projects, so that the effects of the Jan. 1 rise will not really be felt until next quarter. Current bookings are holding up well, and there is considerable activity among builders of small boats. Specifications for the second tube of the Midtown Hudson tunnel include 692,000 lb. of $\frac{3}{8}$ in. plate for curbings, and 1200 fresh air flues that will require about 100 lb. each of 20-gage sheets.

Reinforcing Bars

With the exception of about 300 tons of bars for a tide gate and dam at Flushing, which was awarded to the Bethlehem Steel Co., no awards of reinforcing steel in this area were reported this week. Prices are generally firm, but there are several companies who are said to bid under the market regularly. About 670 tons of reinforcing steel is required for the second tube of the Midtown Hudson Tunnel, on which project Mason & Hangar Co. is contractor. An unstated tonnage, believed to be large, will be out for bids Feb. 19 for a Sheffield Farms Co. building on 11th Avenue, between 56th and 57th Streets, New York.

Ludlum Steel's 1936 Sales at a New Peak

LUDLUM STEEL CO. has announced that its total sales in 1936 were the largest for any year since the company has been in business. The total amounted to well over \$10,500,000. Subject to final audit, its 1936 earnings after all charges and taxes, including the surtax on excess profits, were approximately \$1,100,000, an increase of 18 per cent over the 1929 earnings of \$919,531 and 71 per cent over the profit in 1935 of \$636,729. During the year Ludlum retired its outstanding preferred stock, leaving its 500,000 shares of common stock with no prior obligations.



Pere Marquette has ordered 15 2-8-4 type freight locomotives from Lima Locomotive Works.

Central of Brazil is inquiring for 350 gondola cars and 150 box cars, all about 55 tons' capacity; 250 gondola cars, 150 box cars and 100 flat cars all about 28 tons' capacity. Paulo de Andrade Martins Costa, Rio de Janeiro, Brazil, is mechanical engineer.

Canadian National has ordered 1000 box cars, 300 gondola cars, 175 refrigerator cars and 15 snow plows from Eastern Car Co., Ltd., 1000 box cars from National Steel Car Corp., Ltd., 1000 box cars and 58 flat cars from Canadian Car & Foundry Co., Ltd.

Missouri-Kansas-Texas has ordered 100 40-ton steel sheathed automobile cars and 150 50-ton steel sheathed automobile cars from American Car & Foundry Co.

Northern Pacific is remodeling and air-conditioning 29 passenger cars.

Chesapeake & Ohio has placed three combination passenger and baggage cars with Bethlehem Steel Co.

Illinois Central has ordered 20 40-ton baggage and express cars from American Car & Foundry Co.

Board of Transportation, New York, has rejected bids for 110 to 250 passenger subway cars and will ask new bids in March.

Phelps Dodge Corp. has placed an order for 30 dump cars with Differential Car Co., to be fabricated by Greenville Steel Car Co.

Erie Railroad will build 80 mill cars.

New York, New Haven & Hartford has ordered five self-service grill cars from Pullman-Standard Car Mfg. Co.

Santa Fe, in addition to its recent orders, will build 1000 refrigerator and 350 automobile cars, convert 200 wood box cars to steel construction and equip 650 automobile cars with loading devices.

American Car & Foundry Motors Co. has received an order for 20 motor coaches from Southeastern Greyhound Lines, Lexington, Ky., and for three motor coaches from Union Bus Co., Jacksonville, Fla.

The Pennsylvania is engaged in an extensive program of equipping freight cars with trucks of improved type. The entire program, involving replacement of trucks under 185,000 cars, will be completed this year, and by Jan. 1, 1938, every car in service on Pennsylvania lines will have new cast steel side frame trucks. These trucks are largely constructed from parts reclaimed from those previously in use.

Orders for new freight cars and steam locomotives, Jan. 1, 1937, were larger than at any corresponding date since 1930, according to J. J. Pelley, president, American Association of American Railroads. New freight cars on order totaled 25,592, compared with 12,805 last year and 628 two years ago. On Jan. 1, 1930, 34,581 new cars were on order. Of the total number on order at the beginning of this year, new coal cars numbered 10,029; plain box cars, 9445; automobile box cars, 2977; refrigerator cars, 2571, and flat cars, 279. On Jan. 1, this year, orders for 297 steam locomotives were on the books, as compared with 5 and 7 on Jan. 1, 1936 and 1935, respectively, and 431 on Jan. 1, 1930. Class 1 railroads in 1936 installed 43,941 new freight cars, the largest number since 1930, when 76,909 were put into service. In 1935, 8903 went into use, and 24,103 cars in 1934. New steam locomotives installed in 1936 totaled 87, the larg-

est number for any calendar year since 1931. In 1935 40 locomotives were installed, and 59 in 1934. In 1936 34 new electric and diesel locomotives were put into service, as against 102 in 1935, and 31 in 1934. New electric and diesel locomotives on order Jan. 1, 1937, numbered seven, as compared with three last year and 90 two years ago.

RAILS AND TRACK SUPPLIES

Burlington ordered 15,000 tons from Colorado Fuel & Iron Co.



...Awards of 4385 tons —8050 tons in new projects.

AWARDS

Flushing, N. Y., 300 tons, tide gate and dam, to Bethlehem Steel Co.

Southbridge, Mass., 100 tons, dam, to Bethlehem Steel Co.

Raleigh, N. C., 1400 tons, Albemarle bridge and approach; 600 tons to Hall-Hodges, Inc.; 800 tons to Bethlehem Steel Co. through Virginia Steel Co.

Akron, Ohio, 330 tons, addition for Saalfield Publishing Co., to Truscon Steel Co.

Milwaukee, 150 tons, machine shop, Chain Belt Co., to W. H. Pipkorn Co., local.

Indianapolis, 180 tons, car barn, to Bethlehem Steel Co.; previously reported to Hugh J. Baker & Co.

Peoria, Ill., 230 tons, post office, to Concrete Engineering Co.

Chicago, 100 tons, sewer No. 3 for Sanitary District, to Concrete Steel Co.

St. Joseph, Mo., 400 tons, post office, to an unnamed bidder.

Santa Fe, N. M., 243 tons, railroad underpass and approaches, to an unnamed bidder.

Denver, 493 tons, railroad overpass, to an unnamed bidder.

San Francisco, 204 tons, Standard Brands coffee plant, to Truscon Steel Co.

Santa Cruz, Cal., 150 tons, post office and jail, to Soule Steel Co.

Sacramento, Cal., 100 tons, highway construction, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

PENDING

Medford, Mass., 125 tons, North Metropolitan relief sewer.

Philadelphia, 2000 tons, two schools; bids to be taken in March.

New York, 673 tons, Hudson-Midtown tunnel; bids taken.

New York, 200 tons, East River Drive; bids in.

Buffalo, 150 tons, addition to Trico Products Corp.

Detroit, 2200 tons, pumping station and grit chambers; part of sewage disposal plant project. Bids in.

Minneapolis, 760 tons, Dayton Department store, rail steel bars; bids soon.

Chicago, 237 tons, Nubian Paint & Varnish Co. building, rail steel bars; bids soon.

Akron, Ohio, 500 tons, South Main and Miller Streets grade crossing elimination; bids Feb. 26.

Cleveland, 200 tons, Huntington Park bridge.

San Francisco, 700 tons, East Bay railway yard for San Francisco-Oakland Bay bridge facilities; bids Feb. 24.

San Francisco, 300 tons, overhead railway crossing for Port of Oakland; bids Feb. 24.

Davis, Cal., 250 tons, gymnasium for College of Agriculture; bids Feb. 24.

Harrison Discusses Drop Forging Trends

INTERESTING trends as to equipment and policies in the drop forging industry were discussed by R. E. W. Harrison, vice-president, Chambersburg Engineering Co., at the annual convention of the Drop Forging Association, Chicago, Feb. 11.

The drop forging industry is becoming and must become more analytically minded, according to Mr. Harrison, who prefaced his paper by the statement that the industry did a volume of \$60,000,000 in 1936. Requirements by users of drop forge equipment today are worked out through cooperative investigation between seller and buyer; not as in former days by the mere specification of the capacity needed.

"Maintenance costs have been reduced" said Mr. Harrison, "through advance in simplicity of design and avoidance of gingerbread features." Much ingenuity has been used in refining die design, particularly as to the reduction of draft.

More aggressive merchandising through education was recommended to the association by the speaker, who advocated continuous effort on an increased scale to place the advantages of drop forgings before the chief engineers of our large consuming concerns.

"There is no such thing as a static condition," said Mr. Harrison. "We are either gaining or losing as an industry and to gain, we must sell our products and sell all the time."

Blaw-Knox Co., Blawnox, Pa., and subsidiaries had net profit in 1936, after depreciation and Federal and State taxes, of \$1,548,173, equivalent to \$1.17 a share on outstanding stock, compared with net profit of \$565,230, or 43c. a share, in 1935. Earnings were the best since 1930. Net profit for the second half-year was \$872,880, equivalent to 66c. a share, compared with \$675,293, or 51c. a share, in the first half, and \$263,782, or 20c. a share, in the last half of 1935. Unfilled domestic orders at the end of 1936 were two and a half times those at the end of 1935.



NON-FERROUS.

... Zinc prices increased by \$8 a ton.

• • •
... Copper market nervous on speculative activity.

NEW YORK, Feb. 9.—Copper markets felt the effect of speculative demand last week, the element in London again asserting itself and causing repercussions on the situation here. There was talk of an advance in the domestic price as export quotations rose above the 13.00c. Valley basis. While nervousness is still evident in view of the fact that the red metal for export continues

to sell at 13.27½c., c.i.f., and in some cases as high as 13.37½c., producers state that they are attempting to hold the situation in check and are strongly opposed to raising the domestic price unless conditions absolutely warrant such action. As compared with yesterday, some easing of speculative activity abroad was noted this morning, causing anxious observers to breathe easier. So far the Valley

The Week's Prices. Cents Per Pound for Early Delivery

	Feb. 3	Feb. 4	Feb. 5	Feb. 6	Feb. 8	Feb. 9
Electrolytic copper, Conn.*	13.00	13.00	13.00	13.00	13.00	13.00
Lake copper, N. Y.	13.12½	13.12½	13.12½	13.12½	13.12½	13.12½
Straits tin, spot, New York....	51.00	50.50	50.00	...	50.37½	50.25
Zinc, East St. Louis....	6.00	6.25	6.25	6.25	6.25	6.40
Zinc, New York....	6.35	6.60	6.60	6.60	6.60	6.75
Lead, St. Louis....	5.85	5.85	5.85	5.85	5.85	5.85
Lead, New York....	6.00	6.00	6.00	6.00	6.00	6.00

* Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin 99 per cent plus 19.00c.-21.00c. a lb. delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 17.00c. a lb. delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.25c. a lb., New York.
Quicksilver, \$88.50 to \$92.00 per flask of 76 lb.

Brass ingots, commercial 85-5-5-5, 13.75c. a lb. delivered; in Middle West ¾c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig....	51.50c. to 52.50c.
Tin, bar.....	53.50c. to 54.50c.
Copper, Lake....	13.75c. to 14.75c.
Copper, electrolytic....	13.75c. to 14.75c.
Copper, castings....	13.00c. to 14.00c.
*Copper sheets, hot-rolled.....	20.37½c.
*High brass sheets.....	18.25c.
*Seamless brass tubes.....	20.87½c.
*Seamless copper tubes.....	21.37½c.
*Brass rods.....	16.12½c.
Zinc, slabs.....	7.00c. to 8.00c.
Zinc, sheets (No. 9), casks, 1200 lb. and over.....	10.75c.
Lead, American pig....	7.00c. to 8.00c.
Lead, bar.....	8.00c. to 9.00c.
Lead, sheets, cut....	8.75c.
Antimony, Asiatic....	15.00c. to 16.00c.
Alum., virgin, 99 per cent plus.....	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.....	18.50c. to 20.00c.
Solder, ½ and ¼....	31.50c. to 32.50c.
Babbitt metal, commercial grades....	25.00c. to 65.00c.

* These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33 ⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	54.25c.
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quotation has been left unchanged at 13.00c., though the outlook continues bullish. Sales of copper yesterday to domestic users reflected consumer nervousness, the total being 9814 tons. Total for the month through yesterday rose to 21,861 tons.

Zinc

Gathering increased strength from the tight supply situation, the market staged a rise last week. Prices were advanced \$5 a ton toward the close of trading on Feb. 3 and \$3 a ton additional at yesterday's close. Sales immediately followed each increase, but the higher levels did not become generally effective on the dates mentioned because of lateness of the hour at which advances occurred. The price today, as based on a net increase of \$8 a ton in the East St. Louis quotation, is 6.40c. a lb. Almost no offerings are being made, however, inasmuch as supplies remain extremely scarce. Orders booked during the rise last week totaled around 13,000 tons of Prime Western and brass special. Shipments continued high at around 7200 tons. With respect to possible further increases in the price, the outlook must be regarded as critical.

Lead

Consumer buying was resumed last week, and lead is again an active commodity. Producers attribute the renewed interest partly to strengthening prices in London and to sympathetic influence of a rising zinc market. These factors were merely stimulative, however, as a sound basis exists for lead buying in that users had neglected earlier opportunity to cover against March requirements. Current purchases are largely for this position, although spot ordering exists in some degree. Prices are firm and unchanged at 6.00c. a lb., New York, and 5.85c., St. Louis. The largest producer continues to obtain a \$1 a ton premium on business placed in the East.

Tin

Prices eased on dull trading until the spot Straits quotation touched 50c. a lb. as the week closed. Futures were at a discount, and, in response to offerings at less than 50c., buyers became plentiful. Subsequently, dealers and importers raised their quotations, which had the effect of shutting off the business. It appears, therefore, that at present little or no market exists for tin at other than a price basis on the under side of 50c. Currently offerings are above this limit, the spot Straits quotation today being about 50.25c. a lb., with trading very dull.



IRON AND STEEL SCRAP

... Advance at Pittsburgh of 25c. lifts composite to \$19 a gross ton.

... Buoyant undertone still discernible in principal consuming areas.

In the absence of important consumer purchases, the markets over the country have received their main stimulus during the week from the high prices paid for important railroad lists. Taking their cue from these sales, holders of scrap accumulations are not so anxious to sell; consequently dealers and brokers have been forced to lift offers in principal buying centers to secure adequate tonnage to meet short orders. The result has been a 25c. advance at Pittsburgh, which in turn has raised the composite figure to \$19 a gross ton, the highest level the composite has reached since Jan. 27, 1925. In the East, export activity continues to support prices at a high level, even though domestic demand has at times shown an inclination to lag. Boats are leaving weekly from New York, Boston, Philadelphia and Southern ports, with cargoes consigned mostly to Italy and Japan, although England and Poland are scheduled for less-frequent shipments.

Pittsburgh

With dealers obliged to pay better than \$19.25 on short covering and the market exhibiting a strong undertone, No. 1 steel is up 25c. a ton, making it quotable at \$19.25 to \$19.75. Even this quotation is somewhat nominal, since most dealers are unwilling to sell at less than \$20 a ton. Equally significant was the reported sale last week of railroad heavy melting at \$21 a ton, delivered. Export influence in the East is preventing the movement of scrap from that territory into this district and, since practically 70 to 80 per cent of No. 1 steel transactions in this district involve railroad lists, the price paid for railroad heavy melting is an important factor to be considered in judging the current trend.

Chicago

Prices are under extreme pressure to advance to higher levels, and a sale

made yesterday cannot be taken as the measure of what would be done today. Shipments are coming in from long distances, Texas, Arkansas and Missouri River Valley States being regular sources of supplies for Chicago mills. It is estimated that not less than 250,000 tons of scrap is on Lake Superior docks awaiting the opening of spring navigation. This tonnage is probably not a threat to the Chicago price structure inasmuch as shipments from that area usually move to Lake Erie. Borrowings and short turnings continue to move to Chicago docks.

Cleveland

A Cleveland consumer has purchased a small tonnage of No. 1 steel at \$18, and brokers are paying \$17 to \$17.75 for scrap to ship against this order, indicating a slightly firmer local market. The No. 1 steel offered by the New York Central Railroad last week was sold to a Buffalo consumer at \$20. Old rails brought \$22 and cast iron car wheels \$18.55. In spite of a very limited new demand from consumers, the market is firm. The amount of scrap that is coming out at present prices is sufficient to meet, but is not in excess of, current demands. This tends to stabilize prices. Youngstown brokers are paying \$19 for No. 1 steel, \$18 for No. 2 and \$18.50 for bundles to fill outstanding orders.

Philadelphia

No sales of any consequence were reported this week, and the market remains quiet and firm. Prices are unchanged. Export buying prices are still \$18 for No. 1 steel and \$17 for No. 2. Brokers state material is coming out freely at these offering quotations. A 5000-ton vessel is due to begin loading at Port Richmond some time this week. Of the foreign buyers, Italy appears to be most anxious for scrap, with Japan also displaying much interest. Scotland and Poland are seeking material in this country also. Local consumers are believed to be satisfied for the time being and, since there seems to be plenty of scrap in the district, prices may become easier over the

next few weeks, although operations are scheduled to be maintained at present levels.

St. Louis

Dealer offerings of scrap iron are lighter, and supplies are getting tighter. A few items have advanced 50c. to \$1.50 a ton, and dealers say that prices will go higher with the next buying move by the mills. The Missouri Pacific has a list of 30 car-loads of scrap to sell this week.

Cincinnati

Activity in other areas has stimulated optimism the past week, and bids were upped 50c. to \$1.25. Business, however, is restricted to scattered needs and does not justify buoyant dealer sentiment. Early mill buying is still the trade's "round the corner" forecast which keeps market tone strong. Movement of scrap on contract is slower since mills in the flooded area were unable to stack incoming material during high water, and a technical embargo is on in these areas.

Detroit

This market continues strong despite the absence of any new factory lists. In the last week, the principal market factor was a sympathetic movement with other markets. Recent bidding has been very wild, and it is extremely difficult to say what the actual market is, except that the tendency is upward.

Buffalo

The second largest purchase in little more than a week's time was a transaction whereby a Buffalo mill which has not purchased in some weeks acquired between 5000 and 10,000 tons of No. 2 steel and related grades at \$17.50. The market is very strong, particularly for cast and specialties.

Boston

Prices continue very strong, with those for bundled skeleton, steel turnings and steel for export higher than a week ago. Average prices for No. 1 railroad steel are \$19 to \$19.50 a ton delivered, but in at least one instance a broker has booked an order at \$20.50. Selected steel for export is bringing as high as \$16.50 a ton, delivered Army base, while the general run of business is at \$16 to \$16.25.

New York

This market continues to show strength, and prices are holding at a high level. Supplies are quite free. Buoyancy is caused by the strong trend in shipments, both the domestic and export markets continuing to take material in volume. Dealers have raised their buying prices on steel car axles and shafting, but quotations are partly nominal inasmuch as offerings of these particular items are almost non-existent. The principal steel mill grades are unchanged in price.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$19.25 to \$19.75
No. 2 hvy. mltng. steel.	17.50 to 18.00
No. 2 RR. wrought	19.25 to 19.75
Scrap rails	20.50 to 21.00
Rails, 3 ft. and under	22.50 to 23.00
Comp. sheet steel	19.25 to 19.75
Hand. bundled sheets	18.25 to 18.75
Hvy. steel axle turn.	17.75 to 18.25
Machine shop turn	14.00 to 14.50
Short shov. turn	14.50 to 15.00
Mixed bor. & turn	13.50 to 14.00
Cast iron borings	14.00 to 14.50
Cast iron carwheels	18.00 to 18.50
Hvy. breakable cast	15.00 to 15.50
No. 1 cast	17.50 to 18.00
RR. knuckles & cplrs.	25.50 to 26.00
Rail coil & leaf springs	25.50 to 26.00
Rolled steel wheels	25.50 to 26.00
Low phos. billet crops	25.50 to 26.00
Low phos. sh. bar	25.00 to 25.50
Low phos. punchings	24.00 to 24.50
Low phos. plate scrap	24.50 to 25.00
Steel car axles	23.50 to 24.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$17.50 to \$17.75
No. 2 hvy. mltng. steel.	16.50 to 16.75
Comp. sheet steel	16.75 to 17.25
Light bund. stampings	13.00 to 13.50
Drop forge flashings	16.25 to 16.75
Machine shop turn	12.00 to 12.50
Short shov. turn	12.00 to 12.50
No. 1 busheling	16.00 to 16.50
Steel axle turnings	15.00 to 15.50
Low phos. billet crops	22.00 to 22.50
Cast iron borings	12.50 to 13.00
Mixed bor. & turn	12.50 to 13.00
No. 2 busheling	12.50 to 13.00
No. 1 cast	18.50 to 19.00
Railroad grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50
Rails under 3 ft.	22.00 to 22.50
Rails for rolling	21.50 to 22.00
Railroad malleable	18.00 to 18.50
Cast iron carwheels	18.50 to 19.00

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$18.50
No. 2 hvy. mltng. steel.	\$17.50 to 18.00
Hydraulic bund., new	18.00 to 18.50
Hydraulic bund., old	16.00 to 16.50
Steel rails for rolling	18.50 to 19.00
Cast iron carwheels	18.50 to 19.00
Hvy. breakable cast	18.00
No. 1 cast	19.00 to 19.50
Stove plate (steel wks.)	14.50 to 15.00
Railroad malleable	18.00 to 18.50
Machine shop turn	12.50 to 13.00
No. 1 blast furnace	11.00 to 11.50
Cast borings	11.00 to 11.50
Heavy axle turnings	16.50 to 17.00
No. 1 low phos. hvy.	22.50 to 23.00
Couplers & knuckles	22.50 to 23.00
Rolled steel wheels	22.50 to 23.00
Steel axles	23.00 to 23.50
Shafting	22.50 to 23.00
No. 1 RR. wrought	17.00 to 17.50
Spec. iron & steel pipe	15.50 to 16.00
No. 1 forge fire	16.50 to 17.00
Cast borings (chem.)	12.00 to 13.00

CHICAGO

Delivered to Chicago district consumers:	
<i>Per Gross Ton</i>	
Hvy. mltng. steel	\$18.75 to \$19.25
Auto. hvy. mltng. steel	17.00 to 17.50
Alloy free	16.50 to 17.00
Shoveling steel	18.75 to 19.25
Hydraul. comp. sheets	18.25 to 18.75
Drop forge flashings	15.50 to 16.00
No. 1 busheling	17.25 to 17.75
Rolled carwheels	21.00 to 21.50
Railroad tires, cut	21.00 to 21.50
Railroad leaf springs	21.00 to 21.50
Axe turnings	17.50 to 18.00
Steel coup. & knuckles	20.50 to 21.00
Coll springs	22.50 to 23.00
Axle turn. (elec.)	18.50 to 19.00
Low phos. punchings	22.00 to 22.50
Low phos. plates, 12 in. and under	22.00 to 22.50
Cast iron borings	10.50 to 11.00
Short shov. turnings	11.50 to 12.00
Machine shop turn	10.00 to 10.50
Reroiling rails	20.75 to 21.25
Steel rails under 3 ft.	21.50 to 22.00
Steel rails under 2 ft.	22.50 to 23.00
Angle bars, steel	20.50 to 21.00
Cast iron carwheels	18.50 to 19.00
Railroad malleable	20.50 to 21.00
Agric. malleable	17.00 to 17.50
<i>Per Net Ton</i>	
Iron car axles	21.00 to 21.50

IRON AND STEEL SCRAP PRICES

Steel car axles	\$22.00 to \$22.50
No. 1 RR. wrought	16.75 to 17.25
No. 2 RR. wrought	16.75 to 17.25
No. 2 busheling, old	9.00 to 9.50
Locomotive tires	17.50 to 18.00
Pipes and flues	14.00 to 14.50
No. 1 machinery cast	16.00 to 16.50
Clean auto. cast	15.00 to 15.50
No. 1 railroad cast	15.00 to 15.50
No. 1 agric. cast	12.50 to 13.00
Stove plate	11.50 to 12.00
Grate bars	12.50 to 13.00
Brake shoes	12.50 to 13.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel	\$15.00 to \$15.50
No. 2 hvy. mltng. steel	14.25 to 14.75
Borings and turnings	11.50 to 12.00
Long turnings	10.75 to 11.25
Short shov. turnings	11.75 to 12.25
No. 1 machinery cast	15.00 to 15.50
Automotive cast	16.25 to 16.75
Hydraul. comp. sheets	16.00 to 16.50
Stove plate	9.25 to 9.75
New factory bushel	15.00 to 15.50
Old No. 2 busheling	9.50 to 10.00
Sheet clippings	12.00 to 12.50
Flashings	14.50 to 15.00
Low phos. plate scrap	17.00 to 17.50

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$18.50 to \$19.00
Hydraulic bundles	18.25 to 18.75
Machine shop turn	14.00 to 14.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mltng. steel	\$18.50 to \$19.00
No. 2 hvy. mltng. steel	17.00 to 17.50
Scrap rails	17.50 to 18.00
New hy. bndled sheet	17.00 to 17.50
Old hydraul. bundles	14.50 to 15.00
Drop forge flashings	17.00 to 17.50
No. 1 busheling	17.00 to 17.50
Hvy. axle turnings	11.00 to 11.50
Machine shop turn	12.50 to 12.75
Knuckles & couplers	21.00 to 21.50
Coil & leaf springs	21.00 to 21.50
Rolled steel wheels	21.00 to 21.50
Shov. turnings	12.25 to 12.75
Mixed bor. & turn	11.75 to 12.25
Cast iron borings	11.75 to 12.25
Steel car axles	20.50 to 21.00
No. 1 machinery cast	17.00 to 17.50
No. 1 cupola cast	16.25 to 16.75
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	20.50 to 21.50
Cast iron carwheels	16.00 to 16.50
Railroad malleable	18.50 to 17.50
Chemical borings	13.00 to 13.50

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$12.50 to \$13.00
Scrap steel rails	12.50 to 13.00
Short shov. turnings	8.00
Stove plate	8.50
Steel axles	15.00
Iron axles	15.00
No. 1 RR. wrought	10.00
Rails for rolling	14.00
No. 1 cast	13.50
Tramcar wheels	13.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:	
Selected hvy. steel	\$16.50 to \$17.00
No. 1 hvy. melting	16.00 to 16.50
No. 2 hvy. melting	14.50 to 15.00
No. 1 locomotive tires	17.00 to 17.50
Misc. stand.-sec. rails	16.75 to 17.25
Railroad springs	19.00 to 19.50
Bundled sheets	11.00 to 11.50
No. 2 RR. wrought	16.00 to 16.50
No. 1 busheling	13.00 to 13.50
Cast bor. & turn	5.50 to 6.00
Rails for rolling	18.00 to 18.50
Machine shop turn	6.00 to 6.50
Heavy turnings	10.50 to 11.00
Steel car axles	21.00 to 21.50
Iron car axles	22.00 to 22.50
No. 1 RR. wrought	14.00 to 14.50
Steel rails under 3 ft.	17.50 to 18.00
Steel angle bars	16.75 to 17.25
Cast iron carwheels	16.00 to 16.50
No. 1 machinery cast	13.00 to 13.50
Railroad malleable	17.50 to 18.00
No. 1 railroad cast	13.25 to 13.75
Stove plate	11.25 to 11.75
Agric. malleable	12.50 to 13.00
Grate bars	11.50 to 12.00
Brake shoes	13.00 to 13.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel	\$13.30 to \$13.80
Scrap rail's	13.30 to 13.80
No. 2 steel	11.55 to 12.05
Breakable cast	13.00
Machine shop turn	8.50 to 8.55
Unmixed bor. & turn.	7.00 to 8.25
Bund. skeleton long	12.25 to 12.30
Shafting	16.75 to 17.00
Cast bor. chemical	7.00 to 8.75

Per gross ton delivered consumers' yards:	
Textile cast	\$13.25 to \$16.50
No. 1 machine cast	13.75 to 15.50
Stove plate	10.00 to 10.50

EXPORT

Dealers' buying prices per gross ton:	
New York, delivered alongside barges	
No. 1 hvy. mltng. steel	\$14.00
No. 2 hvy. mltng. steel	13.00
No. 2 cast	12.00
Stove plate	\$10.50 to 11.00
Rails (scrap)	13.50

Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel	\$18.00
No. 2 hvy. mltng. steel	17.00

New Orleans, on cars at Stuyvesant Dock	

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PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Lb.
Rerolling \$34.00
Forging quality 40.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open-hearth or Bessemer \$34.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared 1.80c.

Wire Rods

(No. 5 to 15/32 in.)

Per Gross Ton
F.o.b. Pittsburgh or Cleveland \$43.00
F.o.b. Chicago, Youngstown or Anderson, Ind. 44.00
F.o.b. Worcester, Mass. 45.00
F.o.b. Birmingham 46.00
F.o.b. San Francisco 52.00
F.o.b. Galveston 49.00

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.

F.o.b. Pittsburgh 2.20c.
F.o.b. Chicago or Gary 2.25c.
F.o.b. Duluth 2.35c.
Del'd Detroit 2.35c.
F.o.b. Cleveland 2.25c.
F.o.b. Buffalo 2.30c.
Del'd Philadelphia 2.51c.
Del'd New York 2.55c.
F.o.b. Birmingham 2.35c.
F.o.b. cars dock Gulf ports 2.60c.
F.o.b. cars Pacific ports 2.75c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh 2.05c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 2.10c.
F.o.b. Buffalo 2.15c.
F.o.b. Birmingham 2.20c.
F.o.b. cars dock Gulf ports 2.45c.
F.o.b. cars dock Pacific ports 2.60c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.25c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.30c.
Del'd Detroit 2.40c.
F.o.b. cars dock Gulf ports 2.65c.
F.o.b. cars dock Pacific ports 2.65c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.10c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.15c.
F.o.b. cars dock Gulf ports 2.50c.
F.o.b. cars dock Pacific ports 2.50c.

Iron

F.o.b. Chicago 2.15c.
F.o.b. Pittsburgh (refined) 3.25c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh 2.55c.
F.o.b. Cleveland, Chicago and Gary 2.60c.
F.o.b. Buffalo 2.65c.
Del'd Detroit 2.70c.
Del'd eastern Michigan 2.75c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.

F.o.b. Pittsburgh 2.05c.
F.o.b. Chicago or Gary 2.10c.
Del'd Cleveland 2.235c.
F.o.b. Coatesville or Spar. Pt. 2.15c.
Del'd Philadelphia 2.235c.
Del'd New York 2.33c.
F.o.b. Birmingham 2.20c.
F.o.b. cars dock Gulf ports 2.45c.

F.o.b. cars dock Pacific ports 2.60c.
Wrought iron plates, f.o.b. Pittsburgh 3.20c.

Floor Plates

F.o.b. Pittsburgh 3.60c.
F.o.b. Chicago 3.65c.
F.o.b. Coatesville 3.70c.
F.o.b. cars dock Gulf ports 4.00c.
F.o.b. cars dock Pacific ports 4.15c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh 2.05c.
F.o.b. Chicago 2.10c.
Del'd Cleveland 2.235c.
F.o.b. Buffalo or Bethlehem 2.15c.
Del'd Philadelphia 2.255c.
Del'd New York 2.305c.
F.o.b. Birmingham (standard) 2.20c.
F.o.b. cars dock Gulf ports 2.45c.
F.o.b. cars dock Pacific ports 2.60c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh 2.40c.
F.o.b. Chicago or Buffalo 2.50c.
F.o.b. cars dock Gulf or Pacific Coast ports 2.85c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton \$39.00
Angle bars, per 100 lb. 2.55c. to 2.70c.

F.o.b. Basing Points

Light rails (from billets) per gross ton \$38.00
Light rails (from rail steel) per gross ton 37.00

Base per 100 Lb.

Spikes 2.90c.
Tie plates, steel 2.10c.
Tie plates, Pacific Coast ports 2.20c.
Track bolts, to steam railroads 4.00c.
Track bolts, to jobbers, all sizes (per 100 counts) 65-5-5 per cent off list
Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh 2.15c.
No. 10, f.o.b. Gary 2.25c.
No. 10, del'd Detroit 2.35c.
No. 10, del'd Philadelphia 2.46c.
No. 10, f.o.b. Birmingham 2.30c.
No. 10, f.o.b. cars dock Pacific ports 2.70c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh 2.80c.
No. 24, f.o.b. Gary 2.90c.
No. 24, del'd Detroit 3.00c.
No. 24, del'd Philadelphia 3.11c.
No. 24, f.o.b. Birmingham 2.95c.
No. 24, f.o.b. cars dock Pacific ports 3.45c.
No. 24, wrought iron, Pittsburgh 4.50c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh 2.80c.
No. 10 gage, f.o.b. Gary 2.90c.
No. 10 gage, f.o.b. Detroit 3.00c.
No. 10 gage, del'd Philadelphia 3.11c.
No. 10 gage, f.o.b. Birmingham 2.95c.
No. 10 gage, f.o.b. cars dock Pacific ports 3.40c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh 3.25c.
No. 20 gage, f.o.b. Gary 3.35c.
No. 20 gage, del'd Detroit 3.45c.
No. 20 gage, del'd Philadelphia 3.56c.
No. 20 gage, f.o.b. Birmingham 3.40c.
No. 20 gage, f.o.b. cars dock Pacific ports 3.80c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh 3.40c.
No. 24, f.o.b. Gary 3.50c.
No. 24, del'd Philadelphia 3.71c.
No. 24, f.o.b. Birmingham 3.55c.
No. 24, f.o.b. cars dock Pacific ports 4.00c.
No. 24, wrought iron, Pittsburgh 5.15c.

Electrical Sheets (F.o.b. Pittsburgh)

Base per Lb.

Field grade 3.20c.
Armature 3.55c.
Electrical 4.05c.
Special Motor 5.10c.
Special Dynamo 5.80c.
Transformer 6.30c.
Transformer Special 7.30c.
Transformer Extra Special 7.80c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh 3.70c.
F.o.b. Gary 3.80c.
F.o.b. cars dock Pacific ports 4.40c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh 3.20c.
No. 20, f.o.b. Gary 3.30c.
No. 20, f.o.b. Birmingham 3.80c.
No. 20, f.o.b. cars dock Pacific ports 3.80c.

Tin Plate

Base per Box

Standard cokes, f.o.b. Pittsburgh district mill \$4.85
Standard cokes, f.o.b. Gary 4.95

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes Manufacturing Ternes

Per Base Box

F.o.b. Pittsburgh *\$4.15

F.o.b. Gary * 4.25

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)
8-lb. coating I.C. \$10.00
15-lb. coating I.C. 12.00
20-lb. coating I.C. 13.00
25-lb. coating I.C. 14.00
30-lb. coating I.C. 15.25
40-lb. coating I.C. 17.50

Hot-Rolled Hoops, Bands, Strip and Flats under ¼ In.

Base per Lb.

All widths up to 24 in., Pittsburgh 2.15c.

All widths up to 24 in., Chicago 2.25c.

All widths up to 24 in., del'd Detroit 2.35c.

All widths up to 24 in., Birmingham 2.30c.

Cooperage stock, Pittsburgh 2.25c.

Cooperage stock, Chicago 2.35c.

Cold-Rolled Strip*

Base per Lb.

F.o.b. Pittsburgh 2.85c.
F.o.b. Cleveland 2.85c.
Del'd Chicago 3.13c.
F.o.b. Worcester 3.05c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh

and

Cleveland Worcester

Carbon 0.25-0.50%	2.85c.	3.05c.
.51-.75	3.95c.	4.15c.
.76-1.00	5.70c.	5.90c.
Carbon Over 1.00	7.75c.	7.95c.

Fender Stock

No. 14, Pittsb'gh or Cleveland	3.10c.
No. 14, Worcester	3.50c.
No. 20, Pittsb'gh or Cleveland	3.50c.
No. 20, Worcester	3.90c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

Per Lb.

Bright wire 2.60c.
Spring wire 3.20c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade

Base per Keg

Standard wire nails \$2.25

Smooth coated nails 2.25

Base per 100 Lb.

Annealed fence wire \$2.90

Galvanized fence wire 3.30

Polished staples 2.95

Galvanized staples 3.20

Barbed wire, galvanized 2.75

Twisted barbless wire 2.75

Woven wire fence, base column, 63.00

Single loop bale ties, base column 55.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Wrought Iron

In.	Black Galv.	In.	Black Galv.
1/8	.57	37	1/4 & 3/8 .6+ +26
1/4 to 3/8	60	44 1/2	1/2 27 10 1/2
1/2	64 1/2	55	3/4 32 16
3/4	67 1/2	59	1 & 1 1/4 35 21
1 to 3	69 1/2	61 1/2	1 1/2 39 23 1/2
		2	2 38 1/2 23

Lap Weld

2	62	53 1/2	2	32 1/2	18
2 1/2	3.65	56 1/2	2 1/2 to 3 1/2	33 1/2	20 1/2
3 1/2	6.67	58 1/2	4 to 8	35 1/2	24
7 & 8.66	56 1/2	9	to 12	28 1/2	15
9 & 10.65 1/2	56				
11 & 12.64 1/2	55				

Butt Weld, extra strong, plain ends

1/8	55 1/2	42 1/2	1/4 & 3/8 .7+ +39
1/4 to 3/8	57 1/2	46 1/2	1/2 28 13
1/2	62 1/2	54 1/2	3/4 33 18
3/4	66 1/2	58 1/2	1 to 2.39 24 1/2
1 to 3	68 1/2	61	

Lap Weld, extra strong, plain ends

2	60	52 1/2	2	35 1/2	21 1/2
2 1/2	3.64	56 1/2	2 1/2 to 4.41	28 1/2	
3 1/2	6.67	60	4 to 6.40 1/2	28	
7 & 8.66	57		7 & 8.41 1/2	23 1/2	
9 & 10.65 1/2	56		9 to 12.32	20 1/2	
11 & 12.64 1/2	55				

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold	Hot
	Drawn	Rolled
1 in. o.d.	13 B.W.G. \$ 8.60	8.60
1 1/2 in. o.d.	13 B.W.G. 10.19	9.26
1 1/2 in. o.d.	13 B.W.G. 11.26	10.23
1 1/2 in. o.d.	13 B.W.G. 12.81	11.64
2 in. o.d.	13 B.W.G. 14.35	13.04
2 1/2 in. o.d.	13 B.W.G. 16.00	14.54
2 1/2 in. o.d.	12 B.W.G. 17.61	16.01
2 1/2 in. o.d.	12 B.W.G. 19.29	17.54
2 1/2 in. o.d.	12 B.W.G. 20.45	18.59

3 in. o.d.	12 B.W.G. \$21.45	\$19.50
4 1/2 in. o.d.	10 B.W.G. 41.08	37.35
3 1/2 in. o.d.	11 B.W.G. 27.09	24.62
4 in. o.d.	10 B.W.G. 33.60	30.54
4 1/2 in. o.d.	10 B.W.G. 41.08	37.35
5 in. o.d.	9 B.W.G. 51.56	46.87
6 in. o.d.	7 B.W.G. 79.13	71.90

Extra for less-carload quantities:		
25,000 lb. or ft. to	39,999 lb. or ft.	5 %
12,000 lb. or ft. to	24,999 lb. or ft.	12 1/2 %
6,000 lb. or ft. to	11,999 lb. or ft.	25 %
2,000 lb. or ft. to	5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.		50 %

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago	\$50.00
6-in. and larger, del'd New York	48.00
*6-in. and larger, Birmingham	42.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	50.50
F.o.b. dock, Seattle	50.50
4-in. f.o.b. dock, San Francisco or Los Angeles	53.50
F.o.b. dock, Seattle	53.50

Class "A" and gas pipe, \$3 extra.

4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$41, Birmingham, and \$49.50, delivered Chicago; and 4-in. pipe, \$44, Birmingham, and \$52.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. x 6 in. and smaller	70
Larger than 1/2 in.	65 and 10
Lag bolts	65 and 10
Plow bolts, Nos. 1, 2, 3, and 7 heads	65, 10 and 10
Hot-pressed nuts, blank or tapped, square	65 and 10
Hot-pressed nuts, blank or tapped, hexagon	65 and 10
C.p.c and t, square or hex. nuts, blank or tapped	65 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes	60, 20 and 5

Stove bolts in packages, nuts attached	72 1/2
Stove bolts in packages, with nuts separate	72 1/2 and 5
Stove bolts in bulk	81 1/2
On stove bolts freight is allowed to destination on 200 lb. and over.	

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland \$3.25
F.o.b. Chicago or Birmingham 3.35

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh 70 and 5
F.o.b. Cleveland 70 and 5
F.o.b. Chicago and Birm'g'm. 70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread 3/8 in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy Steel Blooms, Billets and Slabs	
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, Massillon or Canton.	
Base price, \$55 a gross ton.	
Alloy Steel Bars	
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.	
Open-hearth grade, base	2.75c.
Delivered, Detroit	2.90c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (1 1/2% Nickel)	\$0.25
2100 (1 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
6100 Chromium Vanadium Bar	1.10c.
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric turned steel is 50c. higher. The differential for cold-drawn bars 1/2% per lb. higher with separate extras.

Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base.

Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.25c. base per lb. Delivered Detroit, 3.40c.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

Per Lb.

Forging billets	19.55c.

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IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	<i>Base per Lb.</i>
Plates	3.40c.
Structural shapes	3.40c.
Soft steel bars and small shapes	3.30c.
Reinforcing steel bars	3.30c.
Cold-finished and screw stock:	
Rounds and hexagons	3.80c.
Squares and flats	3.80c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	3.50c.
Hoops	4.00c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.65c.
Galv. sheets (No. 24), 25 or more bundles	4.25c.
Hot-rolled sheets (No. 10)	3.25c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.94
Spikes, large	3.25c.
<i>Per Cent Off List</i>	
Track bolts, all sizes, per 100 count	60
Machine bolts, 100 count	65-5
Carriage bolts, 100 count	65-5
Nuts, all styles, 100 count	65-5
Large rivets, base per 100 lb.	\$3.75
Wire, black, soft ann'l'd, base per 100 lb.	3.15c.
Wire, galv. soft, base per 100 lb.	3.55c.
Common wire nails, per keg..	2.50c.
Cement coated nails, per keg.	2.50c.
On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.	
*Delivered in Pittsburgh switching district.	

CHICAGO

	<i>Base per Lb.</i>
Plates and structural shapes..	3.45c.
Soft steel bars, rounds	3.35c.
Soft steel bars, squares and hexagons	3.50c.
Cold-fin. steel bars:	
Rounds and hexagons	3.95c.
Flats and squares	3.95c.
Hot-rolled strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.65c.
Spikes (keg lots)	4.00c.
Track bolts (keg lots)	5.10c.
Rivets, structural (keg lots)	4.10c.
Rivets, boiler (keg lots)	4.10c.
<i>Per Cent Off List</i>	
Machine bolts	*65
Carriage bolts	*65
Lag screws	*65
Hot-pressed nuts, sq. tap or blank	*65
Hot-pressed nuts, hex. tap or blank	*65
Hex. head cap screws	60
Cut point set screws	75 and 10
Flat head bright wood screws	62 and 20
Spring coppers	55
Stove bolts in full packages....	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb.	\$4.05
Com. wire nails, 15 kegs or more	2.70c.
Cement c't'd nails, 15 kegs or more	2.70c.
On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.	
*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.	

NEW YORK

	<i>Base per Lb.</i>
Plates, 1/4 in. and heavier....	3.65c.
Structural shapes	3.62c.
Soft steel bars, rounds	3.62c.
Iron bars, Swed. char-coal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.22c.
Flats and squares	4.22c.
Cold-rolled; strip, soft and quarter hard	3.57c.

IRON AND STEEL WAREHOUSE PRICES

CLEVELAND

	<i>Base per Lb.</i>
Plates and struc. shapes	3.56c.
Soft steel bars	3.25c.
†Reinforc. steel bars	2.25c.
†Cold-finished steel bars	3.95c.
Flat-rolled steel under 1/4 in.	3.66c.
Cold-finished strip	†3.25c.
Hot-rolled annealed sheets (No. 24)	4.31c.
Galvanized sheets (No. 24)	4.91c.
Long terne sheets (No. 24)	5.55c.
Armco iron, galv. (No. 24)	5.85c.
Toncan iron, galv. (No. 24)	5.85c.
Galvannealed (No. 24)	5.95c.
Armco iron, hot-rolled annealed (No. 24)	5.30c.
Toncan iron, hot-rolled annealed (No. 24)	5.30c.
Armco iron hot-rolled (No. 10)	4.35c.
Toncan iron, hot-rolled (No. 10)	4.35c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	4.85c.
Standard quality	4.85c.
Deep drawing	5.50c.
Stretcher leveled	5.50c.
SAE, 2300, hot-rolled	7.32c.
SAE, 3100, hot-rolled	5.72c.
SAE, 6100 hot-rolled, annealed	9.92c.
SAE, 2300, cold-rolled	8.30c.
SAE, 3100, cold-rolled, annealed	7.75c.
Floor plate, 1/4 in. and heavier	5.45c.
Standard tool steel	11.75c.
Wire, black, annealed (No. 9)	3.60c.
Wire, galv. (No. 9)	3.85c.
Tire steel, 1 x 1/2 in. and larger	4.11c.
Open-hearth spring steel	4.15c. to 10.15c.
Common wire nails, base per keg	\$3.70

Per Cent Off List

Machine bolts, square head and nut:	
All diameters	65
Carriage bolts, cut thread:	
All diameters	65
* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.	
† 125 lb. and more.	

ST. LOUIS

	<i>Base per Lb.</i>
Plates and struc. shapes	3.69c.
Bars, soft steel (rounds and flats)	3.59c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.74c.
Cold-fin. rounds, shafting, screw stock	4.19c.
Hot-rolled annealed sheets (No. 24)	4.29c.
Galv. sheets (No. 24)	4.89c.
Hot-rolled sheets (No. 10)	3.59c.
Black corrug. sheets (No. 24)	4.29c.
1/2 Galv. corrug. sheets	4.89c.
Structural rivets	4.44c.
Boiler rivets	4.44c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller.	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65
*No. 26 and lighter take special prices.	

PHILADELPHIA

	<i>Base per Lb.</i>
*Plates, 1/4-in. and heavier	3.30c.
*Structural shapes	3.30c.
*Soft steel bars, small shapes, iron bars (except bands)	3.45c.
†Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.18c.
*Steel hoops	3.80c.
*Steel bands, No. 12 and 3/16 in. incl.	3.55c.
Spring steel	5.00c.
*Hot-rolled anneal. sheets (No. 24)	4.15c.
*Galvanized sheets (No. 24)	4.80c.
*Hot-rolled annealed sheets (No. 10)	3.40c.
Diam. pat. floor plates, 1/4 in.	5.25c.
Swedish iron bars	6.25c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CINCINNATI

	<i>Base per Lb.</i>
Plates and struc. shapes	3.65c.
Floor plates	5.40c.
Bars, rounds, flats and angles	3.55c.
Other shapes	3.70c.
Rail steel reinforc. bars	3.40c.
Hoops and bands, 3/16 in. and lighter	3.75c.
Cold-finished bars	4.15c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.05c.
Galv. sheets (No. 24) 3750 lb. or more	4.07c.
Galvanized sheets (No. 24) over 3500 lb.	4.65c.
Hot-rolled sheets (No. 10)	3.50c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg: Any quantity less than carload.	3.04
Cement c't'd nails, base 100-lb keg	3.50
Chain, lin. per 100 lb.	8.35
<i>Net per 100 Ft</i>	
Seamless steel boiler tubes, 2-in.	\$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO

	<i>Base per Lb.</i>
Plates	3.62c.
Struc. shapes	3.50c.
Soft steel bars	3.40c.
Reinforcing bars	2.75c.
Cold-fin. flats and sq.	4.00c.
Rounds and hex.	4.00c.
Cold-rolled strip steel	3.44c.
Hot-rolled annealed sheets (No. 24)	4.46c.
Heavy hot-rolled sheets (3/16 in. to 48 in. wide)	3.72c.
Galv. sheet (No. 24)	5.00c.
Bands	3.72c.
Hoops	3.72c.
Heavy top-rolled sheets	3.47c.
Com. wire nails, base per keg.	\$3.00
Black wire, base per 100 lb. (2500-lb. lots or under)	4.10c.
(Over 2500 lb.)	4.00c.

BOSTON

	<i>Base per Lb.</i>
Channels, angles	3.75c.
Tees and zees, under 3"	4.00c.
H beams and shapes	3.77c.
Plates — Sheared, tank, and univ. mill, 1/4 in. thick and heavier	3.78c.
Floor plates, diamond pattern (mild steel)	5.58c.
Bar and bar shapes (mild steel)	3.75c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.90c. to 4.90c.
Half rounds, half ovals, ovals and bevels	5.00c.
Tire steel	5.00c.
Cold-rolled strip steel	3.495c.
Cold-finished rounds, squares and hexagons	4.30c.
Cold-finished flats	4.30c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	4.55c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.44c.
Structural shapes	3.65c.
Plates	3.65c.
Floor plates	5.40c.
Hot-rolled annealed sheets (No. 24)*	4.34c.
Hot-rolled sheets (No. 10)....	3.44c.
Galvanized sheets (No. 24)**..	5.00c.
Bands and hoops	3.69c.
†Cold-finished bars	4.04c.
Cold-rolled strip	3.43c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.79c.
Bolts and nuts, in cases, 65 per cent off list	
Broken cases	60 per cent off
Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot- rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb. base less .10c.; 10,000 lb. and over, less .15c.	
* Under 400 lb., .50c. over base; 400 to 3499 lb. base; 3500 lb. and over, base less .25c.	
** Under 400 lb., .50c. over base; 400 to 1499 lb. base; 1500 to 3749 lb., base less .20c.; 3750 to 7499 lb., less .40c.; 7500 lb. and over, less .60c.	

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Common wire nails, base per keg

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes..	3.56c.
Soft steel bars, rounds up to 8 in., flats and fillet angles....	3.46c.
Soft steel bars, squares and hexagons	3.61c.
Hot-rolled strip	3.71c.
Hot - rolled annealed sheets (No. 24)	4.16c.
Galvanized sheets (No. 24) ..	4.76c.
Cold-finished steel bars.....	4.06c.
Structural rivets (keg lots)....	4.21c.
Boiler rivets, cone head (keg lots)	4.21c.
Track spikes (keg lots)	4.11c.
Track bolts (keg lots)	5.21c.
Black annealed wire (No. 14 and heavier)	4.16c.
Com. wire nails and cement coated nails	4.16c.
15 kegs and over	2.81c.

	Per Cent Off List
Machine bolts and carriage bolts, $\frac{1}{2}$ x6 and smaller	65
Larger	65
Coach and lag screws	65
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots).....	65

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.60c.
Structural shapes	3.70c.
Plates	3.70c.
Cold-finished bars	4.42c.
Hot-rolled annealed sheets, No. 24	4.30c.
Galvanized sheets, No. 24.....	4.90c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	3.50c.
Structural shapes	3.60c.
Reinforcing bars	prices on application
Plates	3.60c.
Hot-rolled sheets, No. 10	3.45c.
Bands	3.50c.
Hoops	3.75c.
Special threading steel	3.60c.
Diamond pattern floor plates $\frac{1}{4}$ in. and heavier	5.60c.
Galvanized bars, bands and small shapes	6.00c.
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	4.15c.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.71c.
Iron bars	3.71c.
Reinforcing bars	3.71c.
Structural shapes	3.81c.
Plates	3.81c.
Hot-rolled sheets No. 10	3.66c.
Hot-rolled annealed sheets, No. 24*	3.56c.
Galvanized sheets No. 24*	4.16c.
Steel bands	3.91c.
Cold-finished bars	4.51c.

* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	3.82c.
Shapes, bar size	3.82c.
Iron bars	3.82c.
Structural shapes	3.92c.
Plates	3.92c.
Hot-rolled sheets, No. 10	3.77c.
Hot-rolled annealed sheets, No. 24	4.67c.
Galvanized sheets, No. 24	5.27c.
Steel bands	4.02c.
Cold-drawn rounds	4.49c.
Cold-drawn flats, squares, hexagons	6.49c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list ..	65
Small rivets, per cent off list ..	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.70c.
Reinforcing bars	3.50c.
Structural shapes	3.80c.
Plates	3.80c.
Hot-rolled sheets, No. 10	3.85c.
Hot-rolled annealed sheets, No. 24	4.55c.
Galvanized sheets, No. 24	4.95c.
Steel bands	4.25c.
Cold-finished steel bars	4.55c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$2.80
Bolts and nuts, per cent off list ..	70-10

PACIFIC COAST

	Base per Lb.
San Fran. Cisco	Los Angeles
Plates, tank and U. M.	3.75c. 4.00c. 3.95c.
Shapes, standard	3.75c. 4.00c. 3.95c.
Soft steel bars..	3.85c. 4.00c. 4.10c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.725c. 2.725c. 3.725c.
Hot - rolled an- nealed sheets (No. 24)	4.65c. 4.60c. 4.85c.
Hot-rolled sheets (No. 10)	3.95c. 4.15c. 4.10c.
Galv. sheets (No. 24 and lighter) 22 and heavier)	5.25c. 5.05c. 5.35c.
Galv. sheets (No. 22 and heavier)	5.50c. 5.20c. 5.35c.
Cold finished steel Rounds	6.30c. 6.35c. 6.60c.
Squares and hexagons	7.55c. 7.60c. 6.60c.
Flats	8.05c. 8.10c. 7.60c.
Common wire nails-base per keg less carload	\$3.10 \$3.05 \$3.10

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$48.00
High-heat duty, New Jersey...	58.00
High-heat duty, Ohio	43.00
Intermediate, Pennsylvania, Maryland, Kentucky, Mis- souri and Illinois	43.00
Intermediate, New Jersey.....	46.00
No. 1, Ohio	40.00
Ground fire clay, per ton	7.00
5 per cent trade discount on fire clay brick.	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$48.00
Chicago District	57.00
Birmingham	48.00
Silica cement per net ton	8.50
5 per cent trade discount on silica brick.	

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plym- outh Meeting and Chester...\$47.00	
Chemically bonded f.o.b. Balti- more, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester, Pa.	\$67.00
Chemically bonded f.o.b. Balti- more	57.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks).....\$45.00	
Domestic, f.o.b. Baltimore and Chester, In sacks	42.00
Domestic, f.o.b. Chewelah, Wash. 24.00	

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$22.75
F.o.b. Bethlehem, Birdsboro, and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.27
Delivered Newark or Jersey City	23.39
Delivered Philadelphia	22.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	21.00
F.o.b. Jackson, Ohio	22.75
Delivered Cincinnati	21.07
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	18.50
Delivered San Francisco, Los Angeles or Seattle	23.00
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are \$3c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of .70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$22.25
F.o.b. Bethlehem, Birdsboro, and Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	20.50
Delivered Cincinnati	21.01
Delivered Canton, Ohio	21.76
Delivered Mansfield, Ohio	22.26
F.o.b. Jackson, Ohio	22.25
F.o.b. Provo, Utah	18.00
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Everett, Mass.	\$23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Boston Switching District	24.50
Delivered Newark or Jersey City	24.39
Delivered Philadelphia	23.76
F.o.b. Buffalo and Erie, Pa., and Duluth	22.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	21.50
F.o.b. Birmingham	22.50
Delivered Cincinnati	22.51
Delivered Canton, Ohio	22.76
Delivered Mansfield, Ohio	23.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.

Gray Forge
Valley or Pittsburgh furnace

.\$20.50

Charcoal

Lake Superior furnace

.\$23.50

Delivered Chicago

26.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sll. 2.25 to 2.75

.\$21.00

No. 2 fdy., sll. 1.75 to 2.25

20.50

Malleable

21.00

Basic

20.50

Delivered Montreal

No. 1 fdy., sll. 2.25 to 2.75

.\$22.50

No. 2 fdy., sll. 1.75 to 2.25

22.00

Malleable

22.50

Basic

22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)

.\$80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%

.\$26.00

50-ton lots 3-mo. shipment

24.00

F.o.b. New Orleans

26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)

.\$69.50

50% (ton lots)

77.00

75% (carloads)

126.00

75% (ton lots)

136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 6.00 to

6.50%

.\$24.50

For each additional 0.5% silicon up to 17%.

50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton

additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%

.\$29.50

10.51 to 11.00%

30.00

11.00 to 11.50%

30.50

11.51 to 12.00%

31.00

12.01 to 12.50%

31.50

12.51 to 13.00%

32.00

13.01 to 13.50%

32.50

13.51 to 14.00%

33.00

14.01 to 14.50%

33.50

14.51 to 15.00%

34.00

15.01 to 15.50%

34.50

15.51 to 16.00%

35.00

16.01 to 16.50%

35.50

16.51 to 17.00%

36.00

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads

.\$1.30

Ferrotungsten, lots of 5000 lb.

1.35

Ferrotungsten, smaller lots

1.40

Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb.

contained Cr delivered, in car-

loads, and contract

10.00c.

Ferrochromium, 2%

carbon

16.50c. to 17.00c.

Ferrochromium, 1%

carbon

17.50c. to 18.00c.

Ferrochromium, 0.10%

carbon

19.50c. to 20.00c.

Ferrochromium, 0.06%

carbon

20.00c. to 20.50c.

Ferrovanadium, del. per lb. contained V

.\$2.70 to \$2.90

Ferrocolumbium, per lb. contained columbium, f.o.b. Ni-

agara Falls, N. Y.

.\$2.50

Ferrocobaltitanium, 15 to 18%

Tl, 7 to 8% C, f.o.b. furnace

carload and contract per net

ton

.\$137.50

Ferrocobaltitanium, 17 to 20% Tl, 3 to 5% C, f.o.b. fur-

nace, carload and contract,

per net ton

142.50

Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross

ton

58.50

Ferrophosphorus, electric, 24%, in carloads, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.

75.00

Ferromolybdenum, per lb. Mo

del.

95c.

Calcium molybdate, per lb. Mo

del.

80c.

Silico spiegel, per ton, f.o.b.

furnace, carloads

.\$38.00

Ton lots or less, per ton

43.00

Silico-manganese, gross ton, delivered.

2.50% carbon grade

85.00

2% carbon grade

90.00

1% carbon grade

100.00

Note: Spot prices are \$5 a ton higher except on

75 per cent ferrosilicon on which premium is

\$10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50% ..

.\$4.80

Old range, non-Bessemer, 51.50% ..

4.65

Mesabi, Bessemer, 51.50% ..

4.65

Mesabi, non-Bessemer, 51.50% ..

4.60

High phosphorus, 51.50% ..

4.40

Foreign Ore

Per Unit

Iron, low phos., copper free, 55

to 58% dry, Algeria ..

13.50c.

Iron, low phos., Swedish aver-

age, 68½% iron ..

Nominal

Iron, basic or foundry, Swe-

dish, aver. 65% iron ..

10.00c.

Iron, basic or foundry, Rus-

sian, aver. 65% iron ..

Nominal

Man., Caucasian, washed

52% ..

34c.

Man., African, Indian,

44-48% ..

25c to 30c.

Man., African, Indian,

49-51% ..

30c.

Man., Brazilian, 46

to 48½% ..

Nominal ..

25c to 30c.

Per Net Ton Unit

Tungsten, Chinese, wolframite,



THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

...Cincinnati machine tool shops now getting back to work.

• • •

...Flood and automobile strikes may be responsible for lighter sales.

• • •

...Several large programs in Detroit area are indefinitely held up.

Cincinnati

WITH normal business activity now possible, local machinery builders, except for the few that sustained high water damage, are in production. Castings problems are the most serious. The few plants that have their own foundries were out of the flood and are not expected to be disturbed. Those depending on melters in the flood zone are appraising two problems: First, how fast will cupolas be fired, and second, to what extent have patterns been damaged by water.

Refiring of cupolas appears to be possible within a week. Receipt of castings before inventories are exhausted is likely, although not in full number and assortment. Rearrangement of shop work to accommodate operations on available castings may cause inconvenience, but is not likely to be disturbing. Examination of patterns, however, reveals fairly substantial damage, but replacement of needed design is possible without production delay.

New business is not up to the heavy volume prior to the flood, but is sizable. Of course, some of the reduction may be the result of mail delay, but a few manufacturers report that strikes and fear of other strikes are operating as a deterrent to buying.

Cleveland

MACHINE tool sales were light the past week, but a fair volume of inquiry came out for single machines. Considerable foreign business is still being offered, and one manufacturer has taken about all the export orders that it will accept during the year under its recently established quota. Uncertainty still prevails here as to when the Cincinnati machine tool manufacturers will be able to resume production and deliveries, suspension of which was caused by the recent

floods. However, it is certain that the interruptions due to the flood will result in considerable extension of delivery dates.

Detroit

THE General Motors strike situation continues to cast a pall of gloom over the local machinery market, although General Motors itself did place an order for 10 production lathes last week. However, large programs for 1938 at Chevrolet, Pontiac, Buick and Cadillac have been held up indefinitely and may go through only in a drastically revised form. Plans for revision of Dodge's cylinder block line are also being held up, perhaps indefinitely, and no prints have yet appeared on the Plymouth cylinder block which is expected to be made on a new line. During the past month Ford Motor Co. and Burroughs Adding Machine Co. have been the principal sustaining factors in the local market.

A few jobbing tool and die shops have been expanding facilities and have made purchases in recent weeks, but greatest activity seems to be centered in drop forge die shops, both of the larger corporations and of the jobbers. Sales and inquiries for die sinking equipment have been running high in recent weeks. Railroad buying originating in this territory is better now than it has been at any time since 1928.

Chicago

INQUIRIES and new buying are less active, probably as a result of heavy commitments made prior to the general price advances. The Santa Fe continues to buy against its list and the Milwaukee Road still centers its attention upon tabulating recent bids. A small list issued by A. O. Smith Corp., Milwaukee, remains dormant. It is reported that J. I. Case Co., Ra-

cine, Wis., will purchase only second-hand equipment for its newly acquired Rock Island plant. Machine tool builders are still digging out of the mud at Cincinnati and it is estimated that in many instances deliveries have been set back 30 days on account of the Ohio River flood.

New York

JANUARY bookings by machine sellers here were exceeded only in December and possibly one other month last year. Total business for 1936 was the best since 1930, and orders which have come in so far this month and inquiries on hand indicate that this high level will at least be maintained and very likely exceeded. A few shipments are finding their way out of Cincinnati, but the situation as a whole remains far from normal. Several plants are cleaning up after the damage wrought by flood waters, and others are still being utilized as havens for the homeless. Deliveries have been extended at least a month, and there will be delays of one sort or another, either in shipping or production during the next several weeks. Local buying is holding up well with all large industrial plants in the district entering the market fairly regularly, and small buyers coming in steadily for single tools for replacement purposes.

Pittsburgh

TOTAL machine tool orders placed on the books in January were in excellent volume. Although February as a rule is an extremely active month, this may not be the case this year, owing to anticipatory orders booked in the past two months. Nevertheless, inquiries and orders are in good volume and represent steady replacement of worn-out machinery. High taxes have brought home to most customers the need for more efficient tools. The exceptionally large volume of car building business scheduled for this year will undoubtedly be reflected in machine tool orders from this source before the year is out. Deliveries are still mixed, but some manufacturers are able to accommodate their dealers with better than average promises. Price advances on those tools not previously affected are in prospect for the near future.

Southern Foundry Conference Feb. 25

THE fifth annual Southern Foundry Conference will be held at Birmingham, Feb. 25 and 26, under the joint sponsorship of the Birmingham chapter of the American Foundrymen's Association, and the Birmingham section of the American Society of Mechanical Engineers. This year's conference is to feature discussions of foundry problems of especial interest to engineers, and will be notable for its sessions on safety and hygiene.



FABRICATED STEEL

... Lettings advance to 25,630 tons from 18,910 tons last week.

... New projects also higher at 27,400 tons as against 18,310 tons a week ago.

NORTH ATLANTIC STATES

Concord, N. H., 100 tons, bridge, to Bethlehem Steel Co.

Worcester, Mass., 150 tons, malt house, to Bethlehem Steel Co.

Boston, 1000 tons, building, Commonwealth Ice & Cold Storage Co., to New England Structural Co., Everett, Mass.

Hartford, 650 tons, extension, South Meadow station, Hartford Electric Light Co., to Lehigh Structural Steel Co., Allentown, Pa.

New York, 470 tons, school No. 104 in Queens, to Drier Structural Steel Co.

New York, 120 tons, warehouse, 520 West 53rd Street, to Ingalls Iron Works Co.

New York, 195 tons, Woolworth store, 86th Street and Third Avenue, to Brooklyn Iron Works.

New York, 1725 tons, garage, 18th Street and Avenue A, to Post & McCord.

Queens County, N. Y., 1440 tons, highway bridge, to Bethlehem Steel Co.

Brewster, N. Y., 210 tons, garage and office, New York State Electric & Gas Co., to Belmont Iron Works, Philadelphia.

Delaware County, N. Y., 305 tons, highway bridge, to American Bridge Co.

Utica, N. Y., 180 tons, assembly hall, to Utica Structural Steel Co.

Cuba, N. Y., 100 tons, unnamed plant for which Chamber of Commerce advertised for bids, to R. S. McManus Steel Construction Co., Buffalo.

Niagara Falls, N. Y., 100 tons, addition to Walker Laundry, to R. S. McManus Steel Construction Co.

Buffalo, 2000 tons, addition for Trico Products Corp., to Bethlehem Steel Co.

Philadelphia, 200 tons, two schools, to Fort Pitt Bridge Works Co.

Philadelphia, 100 tons, Atlantic Refining Co. building at Point Breeze, to Belmont Iron Works.

Philadelphia, 180 tons, Charles Lennig Co. building, to Frank M. Weaver, Lansdale, Pa.

Bristol, Pa., 300 tons, additional Lennig Co. structures, to Frank M. Weaver Co.

Williamsport, Pa., 130 tons, beams for Pennsylvania Department of Supplies, to Carnegie-Illinois Steel Corp.

Huntingdon, Pa., 235 tons, highway bridge, to Fort Pitt Bridge Works Co.

Pittsburgh, 230 tons, Lemington Avenue school building, to Keystone Engineering Co., Pittsburgh.

Wilmington, Del., 214 tons, addition to color house for duPont Co., to Belmont Iron Works.

SOUTH AND SOUTHWEST

Windsor, W. Va., 260 tons, boiler framing, American Gas & Electric Co., to Indians Bridge Co., Muncie, Ind.

Raleigh, N. C., 3300 tons, Albemarle Sound bridge and approach; 3000 tons to Bethlehem Steel Co., 300 tons to Virginia Bridge Co., Roanoke, Va.

San Bernardino, Fla., 1525 tons, Container Corp. plant, to Jones & Laughlin Steel Corp.

Beaumont, Tex., 500 tons, power station extension for Gulf States Utilities Co., to Lehigh Structural Steel Co.

Bryan County, Okla., 650 tons, Red River bridge, to Illinois Steel Bridge Co., Jackson, Ill.

CENTRAL STATES

Detroit, 3900 tons, addition to turbine house and boiler house, Detroit Edison Co., to Bethlehem Steel Co.

Cleves, Ohio, 165 tons, two oil heaters, to Joseph T. Ryerson & Co., Inc.

Hammond, Ind., 1760 tons, buildings for Union Metal Products Co., to Austin Co., Cleveland.

Hillside, Ill., 440 tons, Wolf Road bridge, to American Bridge Co.

Chicago, 400 tons, South California Avenue grade separation, to Bethlehem Steel Co.

Milwaukee, 250 tons, machine shop, Chain Belt Co., to Milwaukee Bridge Co.

Manitowoc, Wis., 125 tons, machine shop, Manitowoc Shipbuilding Corp., to Wisconsin Bridge & Iron Co., N. Milwaukee.

WESTERN STATES

Reno, Nev., 130 tons, Sierra bridge, to Moore Dry Dock Co., San Francisco.

Seattle, 231 tons, dredger ladders and radio towers, to Standard Steel Fabricators & Boiler Works.

Glendale, Cal., 108 tons, Grand Boulevard bridge floor, to Consolidated Steel Corp.

Los Angeles, 900 tons, addition to main building, North American Aviation Co., to Bethlehem Steel Co.

Woodford and Lang, Cal., 650 tons, bridges, Southern Pacific Co., to American Bridge Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Greenville, N. H., 175 tons, bridge.

New York, 2500 tons, addition to Federal building.

New York, 8000 tons, West 135th to West 146th Streets express highway for New York Central Railroad.

Brooklyn, 250 tons, alterations to Russells' store.

Lodi, N. Y., 250 tons, grade crossing elimination, Lehigh Valley Railroad.

Jefferson County, N. Y., 5800 tons, Thousand Islands international bridge between Canada and United States. American crossing to require 3000 tons, and Canadian section, 2800 tons. Bids to be taken March 2 by Thousand Islands Bridge Authority, Jefferson County.

Elberon and Jersey City, N. J., 250 tons, State bridges.

West Orange, N. J., 800 tons, State armory.

Kearny, N. J., 680 tons, manufacturing and distribution building, Coca-Cola Co.

Pittsburgh, 225 tons, factory building, Fuller Label & Box Co.

Mayview, Pa., 280 tons, men's and women's mental buildings for city of Pittsburgh.

Russell, Pa., 260 tons, State highway bridge, route 61038.

Sullivan County, Pa., 320 tons, bridge; bids Feb. 19.

Jefferson, York and Blair Counties, Pa., 250 tons, three I-beam bridges; bids Feb. 19.

Sparrows Point, Md., 750 tons, cranes for Bethlehem Steel Co.

Baltimore, 300 tons, mill building for Rustless Iron & Steel Co.

THE SOUTH

Berclair, Tenn., 850 tons, Pickwick-Memphis transmission line for Tennessee Valley Authority.

Miami, Fla., 580 tons, bridge.

CENTRAL STATES

Detroit, 1400 tons, Ford Motor Co. tire-making plant; Albert Kahn, Inc., architect.

Dearborn, Mich., 500 tons, building for Montgomery Ward & Co.

Tuscarawas County, Ohio, 100 tons, bridge; bids Feb. 26.

Cleveland, 600 tons, Lorain Avenue grade crossing elimination.

La Crosse, Wis., 2000 tons, interstate bridge over Mississippi River; plans in progress.

St. Louis County, Mo., 275 tons, highway bridges; bids Feb. 13.

WESTERN STATES

Sacramento, Cal., 6000 tons, Government buildings; bids Feb. 25.

FABRICATED PLATES

AWARDS

South Boston, 300 tons, White Fuel Corp., tanks.

New York, 365 tons, water mains on Convent Avenue, to Alco Products Co.

Texas City, Tex., 1800 tons, tanks for Pan American Petroleum & Transport Co., to Chicago Bridge & Iron Works, Chicago.

St. Paul, Minn., 1410 tons, tanks for Shell Petroleum Corp., to Chicago Bridge & Iron Works.

Leetsdale, Pa., 2700 tons, 25 coal barges for Wheeling Steel Corp., to Dravo Corp.

Seattle, 1000 tons, seven steel tanks for Shell Oil Co., to Western Pipe & Steel Co., San Francisco.

SHEET PILING

AWARDS

Belmar, N. J., 216 tons, jetty, evenly divided between Bethlehem Steel Co. and Carnegie-Illinois Steel Corp.

Buffalo, 800 tons, dock work for Republic Steel Corp., to Carnegie-Illinois Steel Corp.

Chicago, 564 tons, extension and rehabilitation of pier, Calumet Park, to Jones & Laughlin Steel Corp.

Cameron Defends the Machine

(CONTINUED FROM PAGE 54)

work all the time. The only market you have for the things you make are those men. And they must have leisure to go out and buy and use and consume the things which they make. The tool has been a great liberator of mankind in that respect. If we could measure up the free hours, the free days, the free minds, which men have gained as a result of the tool it would make a marvelous record.

It is an important discovery we have made in this generation that the higher the cost of a thing, the less of it there is. And the less everyone has of it, the less everyone wants of it, and the less everyone can have of it. High cost means less wages, less to spend in the world, less of the things that we live by. But where production is less costly, made less costly by the tool, there is always more wealth, more money, more things to spend the money on; and more money to spend. More work also—not only the work that men have always done, but work that we have never done before, because now we are doing work that has never been done before.

Mass production is more than mass production. You could gather four million men together and not be able to perform some of the operations that are being performed by one machine in our shops today. Half the world's work today is new work made possible by the tool. Things we have never done since history began we are doing commonly now. It is more than the absorption of the old work by the modern tool. Not the tool coming in and saying, "You go home, I will do your work." But it is the creation of entirely new work to be done by men and constantly bringing more men in to do it.

You know as well as I do that there are publications and demagogues in this country devoted entirely to the denunciation of the machine. Sometimes we try to explain to them and show them by actual experience what happens through the improvement of the machine. But it is no use. There is a subtle hostility and suspicion which will remain with one part of the elder generation and, I think, will never be cured, but will not be

TOOL STEEL

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and the tool steels supplied
by us keep pace by con-
stant improvement.

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nished to manufacturers
the best steels available.
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any part of the heritage of the younger generation. We try to explain that there is labor-saving machinery—machines that lift the burden of labor off men and lift the cost of too much labor off the product, and that serve men in a way of leading them into work they couldn't possibly enter into without it.

Instead of this progress being

welcomed by the class I mention, it is constantly feared as a doom. The very people who protest are beneficiaries of the machine in the price of things they buy. We can show that in the quality of things since the machine tool has come there is no comparison with those of older days. And the greater ease of the workers' daily toil, its cleanliness and safety, and the increase



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are guaranteed to handle water load-
ed with abrasive material and grit.

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San Francisco : 520 Fourth Street

- Round Strand
- Flattened Strand
- "P. F. S."
- Non-Rotating
- Preformed
- Steel Clad
- Locked Coil
- Regular Lay
- Lang's Lay
- Hemp Center
- Wire Rope Center
- Metallic Core
- Seale - Filler Wire
- Warrington

of human dignity throughout industry—you can show how all these things spell social progress to all classes of people. You can show how the factory by taking home work out of the house allowed the home to become a home. Higher standards of life have kept pace with the development of machine tools in our industries. The working wage has gone up and the

hours gone down and conditions improved and income increased. We show all these, but the answer comes with the time worn objections—"the machine has destroyed all skill and intelligence of the working man"; "it has made automatons of the laborer"; "it has degraded men"—and so forth. They have the old untrue romantic ideas that craftsmanship has been de-

stroyed by the machine. As a matter of fact, you and I know that there are more craftsmen today in proportion to the population than there have ever been at any previous period, and more craftsmen are needed today per thousand in the population than were ever needed before. There is actually more skill in what we call our common labor than what was required in much of the craft labor of the period which we think was so romantic. Mass production requires a very high degree of mass intelligence and as we ascend higher into the realm of technical knowledge that intelligence will have to increase more and more. And not only are jobs more numerous today than they were 30 years ago, as shown by the United States population statistics, but we can show that the jobs they have are much better jobs and that the wages have increased four times since the Civil War, three times since 1900 and twice since 1913. And we can show that our universities are crowded today, tens of thousands of students sent there by the needs of industry. The departments of metallurgy and chemistry and engineering and electrical science and business administration, and half a dozen others, are filled with men by tens of thousands who are simply learning a higher trade. And where are they to use their preparation and learning? The demand for work in industry makes it possible. They have been lifted by the tool and by the very necessity of social need to positions that they could never have reached without it.

All we can do in this general discussion is to fall back on the principle that nothing which does so much good to man can possibly be doing the harm to him that these people believe it is doing. There has been a great change, I notice, in the liberal papers of this question. Those that two years ago were assailing the machine and trying to drive it out by tax and license have now turned completely around. The facts have become too much for ranters. The thing is this, as long as the people use and find it to their advantage to use the things produced by these great tools there will be no chance for a backward step.

The full attainment of this stage of advance movement in which we are now has not come. When the full attainment of our objectives

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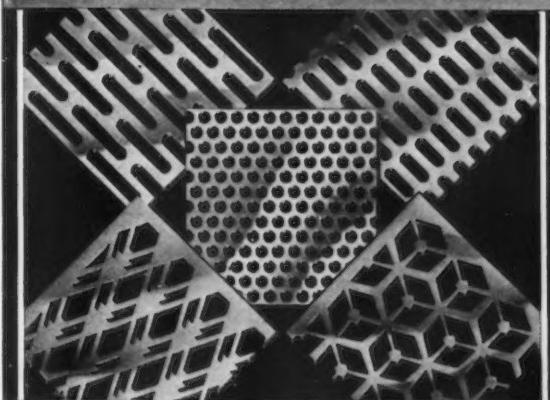
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does come all of these present day problems which seem so big considered alone will simply disappear in the fog. The problem of technological employment will be dead before most of us are dead. Technological unemployment will disappear in the great increase of technological employment. There is going to be a shortage of men when this country begins to take its stride. More than the Government with its laws and more than finance with its control, the social solution of these things is in the hands of engineers and producers, and you must go on. Having brought the people generally to this level of development you can't stop.

There are those who work for society for a humanitarian motive. And there are those who work from a scientific motive, a practical productive motive, and they are the men whose work lasts. There is more humanitarianism in the cold scientific advances of today than there is in the sentimentality that would restrain it. These things to which people object are the very implements of the highest source of humanity. I think the social problem as it now stands is entirely in the hands of engineers and producers.

For what is the social problem? Is it not the difficulty people have in getting things they need to live as we think Americans ought to live? What makes it hard for them to get them? Is it not that these things are too costly? And what makes them costly? Is it not that they are too scarce? What makes them scarce? Is it not that there are not enough of them produced? And why are there not enough of them produced? Because it is still too expensive to produce all we ought to have to supply every family in this country. The crux of the social question is production, not distribution. . . . This nation has never yet produced enough for its own people. It will never produce enough until it deliberately sets itself to the job of producing more. . . . We will never be a country to be entirely proud of until we deliberately go to work as a national service to bring our production methods to such a stage of efficiency that we can make it flow far enough to reach the last family on the last acre and the poorest family in the last street. Production will break down the costs of things, it will broaden the flow and length-

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en the flow to these people, and you men who are supplying the tools for that are helping production break down the cost, and the pressure of production and low cost will absolutely force distribution.

We are going to repeat in our social engineering what we have discovered in our production engineering. The mechanical and the

social principle grow out of the same stem. That is why I am not looking to sociologists or to statesmen or moralists for the solution of the social question. I am looking to the production men, to the engineers, to those who deal with good honest stuff and mold it into shape to serve the common life of our people.

DO YOU USE BRONZE?

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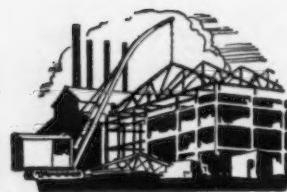
That statement is made in all sincerity, for although Ampco possesses the attributes of bronze, it is vastly different from the general conception of copper-base alloys.

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PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Diesel Equipment Corp., 347 Madison Avenue, New York, manufacturer of diesel engine equipment, parts, etc., has acquired three-story factory at Montrose and Ravenswood Avenues, Chicago, on site 97 x 163 ft., for new plant. Company is now operating branch plant at 3932 West Diversey Street, Chicago, and will consolidate local production at new location.

National Can Co., Inc., 110 East Forty-second Street, New York, has let general contract to Brown-Matthews, Inc., 122 East Forty-second Street, for three-story storage and distributing plant on site, 125 x 200 ft., at Maspeth, L. I. Cost about \$150,000 with equipment.

Washburn Wire Co., 536 East 117th Street, New York, manufacturer of round and flat steel wire specialties, has filed plans for five-story addition, 42 x 180 ft. Cost over \$200,000 with equipment. Bart and John P. Walther, 103 East 125th Street, are architects.

Coca-Cola Bottling Co. of New York, 431 East 165th Street, New York, has engaged William H. and J. F. Dusenbury, 10 East Fortieth Street, architects and engineers, to prepare plans for two-story mechanical-bottling plant at Newburgh, N. Y., where site has been acquired. Bids on general contract will be asked in 30 to 60 days. Cost about \$65,000 with equipment. Company has also purchased building at 35-30 Thirty-eighth Street, Long Island City, and will remodel for new branch bottling and distributing plant. Cost close to \$45,000 with equipment. Same architects are in charge.

United States Radiator Corp., 101 Park Avenue, New York, with plants at Geneva and Dunkirk, N. Y., Detroit and other points, has leased property on East 135th Street, adjoining right-of-way of New York, New Haven & Hartford Railroad, improved with one-story building and will remodel for new factory branch, storage and distributing plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 19 for iron and steel welding rods for Brooklyn, Sewalls Point and Puget Sound Navy yards (Schedule 9437); high-pressure steam traps (Schedule 9949), corrosion-resisting steel gratings (Schedule 9951) for Brooklyn and Philadelphia yards.

United States Engineer Office, First District, New York, asks bids until Feb. 17 for one crawler-mounted concrete mixer, complete with tower and accessories (Circular 182).

Virgin Islands Co., St. Croix, Virgin Islands, has awarded general contract to Boudin Contracting Corp., Christiansted, Virgin Islands, for rebuilding and improving cane sugar mill. New equipment will be installed. Cost over \$200,000 with equipment.

American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, has let general contract to Lee Construction Co., 422 South Church Street, Charlotte, N. C., for one-story addition and improvements to new local factory branch, storage and distributing plant at 822 West Morehead Street, recently acquired. Cost over \$50,000 with equipment.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Feb. 19 for 24,000 ft. cable and eight reels (Circular 122); until Feb. 23, 125 complete steel shelving units (Circular 117).

Ramapo Ajax Corp., 230 Park Avenue, New York, manufacturer of railroad track equipment, a subsidiary of American Brake Shoe & Foundry Co., same address, plans one-story addition to plant at Mahwah, N. J., and improvements in present works. Cost over \$45,000.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until Feb. 17 for 18 circular forming tool blanks and 18 circular cutting-off tools (Circular 501), brass wire, commercial brass strip, and gilding metal strip (Circular 499).

Department of Parks and Public Property, Newark Airport Administration, City Hall, Newark, N. J., has let contract to Oltmer Iron Works, 326 Manhattan Avenue, Jersey City, N. J., for structural steel for one, two and three-story hangar, 213 x 1108 ft., at Newark Airport. Entire structure with shop facilities will cost about \$1,300,000. Financing has been arranged through Federal aid. James W. Costello is chief engineer.

Commanding Officer, Ordnance Department, Raritan Arsenal, Metuchen, N. J., asks bids until Feb. 24 for four portable milling machines, four pedestal grinders and eight portable electric drills (Circular 7), four portage 12-in. screw-cutting lathes (Circular 8), four electric arc welding sets and four 5-kw. portable gasoline-electric generators (Circular 9); until Feb. 25, four portable 12-in. screw-cutting lathes (Circular 11).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 19 for 200 suction regulating valves (Schedule 9935), 300 aircraft lateral inclinometers (Schedule 9924), one motor-driven armature banding and heavy field coil winding machine (Schedule 9973), 800 aircraft tachometer shafts (Schedule 9937) for Philadelphia Navy Yard.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Feb. 16 for 20-conductor transmission cable (Circular 412).

◀ NEW ENGLAND ▶

New Haven Pulp & Board Co., East Street, New Haven, Conn., has plans for addition to power plant. Cost over \$200,000 with equipment. Frederick L. Smith, 21 East Fortieth Street, New York, is architect and engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 16 for one drop forge trimming press (Schedule 9971) for Boston Navy Yard.

Bethlehem Steel Co., East Howard Street, Quincy, Mass., has asked bids on general contract for one-story addition, primarily for storage and distribution. Cost about \$55,000 with equipment. Award for building foundations has been let to J. M. & C. J. Buckley Co., 120 Tremont Street, Boston.

Niles-Bement-Pond Co., 111 Broadway, New York, operating Keller Division, Pratt & Whitney Co., Hartford, is concluding arrangements for purchase of Charter Oak Park, Hartford, as site for plant additions, for which plans will be drawn soon.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Feb. 18 for two selective geared-head lathes (Circular 132), one box furnace complete with automatic control, including regulator, panel board and auxiliary equipment, and one transformer (Circular 126); until Feb. 23, five

hand milling machines and equipment (Circular 41).

New Haven Clock Co., Hamilton Street, New Haven, Conn., manufacturer of clocks and clock mechanisms, has let general contract to F. Taglialatela, 208 Gorham Avenue, Hamden, Conn., for one-story addition, 33 x 110 ft., and improvements in one of plant units. Cost over \$40,000 with equipment.

Board of Education, Meriden, Conn., will build an addition and make alterations to its trade school on Miller Street. Lorenzo Hamilton, Inc., 22 Church Street, Meriden, is architect.

◀ BUFFALO DISTRICT ▶

Iroquois Brewery Co., 230 Pratt Street, Buffalo, and affiliated interest, Iroquois Beverage Co., same address, have filed plans for two one-story additions, primarily for storage and distributing divisions, for which contract for structural steel has been let to Buffalo Structural Steel Corp., 166 Dart Street. Cost over \$60,000 with equipment.

Simonds Saw & Steel Co., Ohio Street, Lockport, N. Y., has let general contract to William A. Becue, 178 Niagara Street, for one-story addition. Cost close to \$50,000 with equipment. Main offices of company are at Fitchburg, Mass.

Faudler Co., 89 East Avenue, Rochester, N. Y., manufacturer of glass-lined enamelled steel tanks, kettles and other vessels, has plans for one-story addition, 250 x 500 ft. Cost over \$400,000 with equipment. Gordon & Kaelber, 311 Alexander Street, are architects.

◀ SOUTH ATLANTIC ▶

Sunshine Brewery Co., West Palm Beach, Fla., has been acquired by William H. Gould, formerly general manager of Wagner Brewing Co., 645 N.W. Thirteenth Street, Miami, Fla., including two-story building on adjoining site. Plant will be remodeled and new equipment installed. Cost over \$60,000 with machinery.

Planter Power Co., Waynesboro, Ga., asks bids until Feb. 17 for about 105 miles of power lines for rural electrification in parts of Jenkins, Burke and Screven counties, including wire and cable, pole line hardware and fittings, meters and other equipment. J. B. McCrary Engineering Corp., Atlanta, Ga., is consulting engineer.

All-Metal Bottle Cooler Corp., 780 Ponce de Leon Place, Atlanta, Ga., manufacturer of bottling equipment, etc., has approved plans for rebuilding part of plant recently damaged by fire, and will carry out project by day labor under direction of S. N. Hodges, 262 Rumson Road, N.E. Cost close to \$30,000 with equipment.

◀ WASHINGTON DIST. ▶

Crown Cork & Seal Co., Eastern Avenue and Kresson Street, Baltimore, has let general contract to Consolidated Engineering Co., 20 East Franklin Street, for one-story machine shop at Haven and Monument Streets. Cost over \$50,000 with equipment. Lucius R. White, Jr., 10 West Chase Street, is architect.

Contracting Officer, Office of Chief of Engineers, Munitions Building, Washington, asks bids until Feb. 23 for 15 35-ft. steel searchlight towers, demountable (Circular 29).

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 19 for brass and bronze pipe fittings, railing fittings, galvanized malleable iron pipe flanges, galvanized malleable iron unions, brass or bronze unions, angle valves, globe valves, check valves, 25,000 steel track splices (Schedule 3222).

Glenn L. Martin Co., Baltimore, manufacturer of airplanes and parts, has let general contract to Carl W. Schmidt, Munsell Building, for additions to plant, including main one-story units, 300 x 500 ft., and 100 x 338 ft., first noted for assembling large type aircraft. Other buildings also will be erected. Entire project will cost close to \$2,000,000. Taylor & Fisher, 1012 North Calvert Street, Baltimore, are architects. Gardner W. Carr is vice-president and general manager.

Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until Feb. 16 for 12,000 tinplate containers (Circular 91).

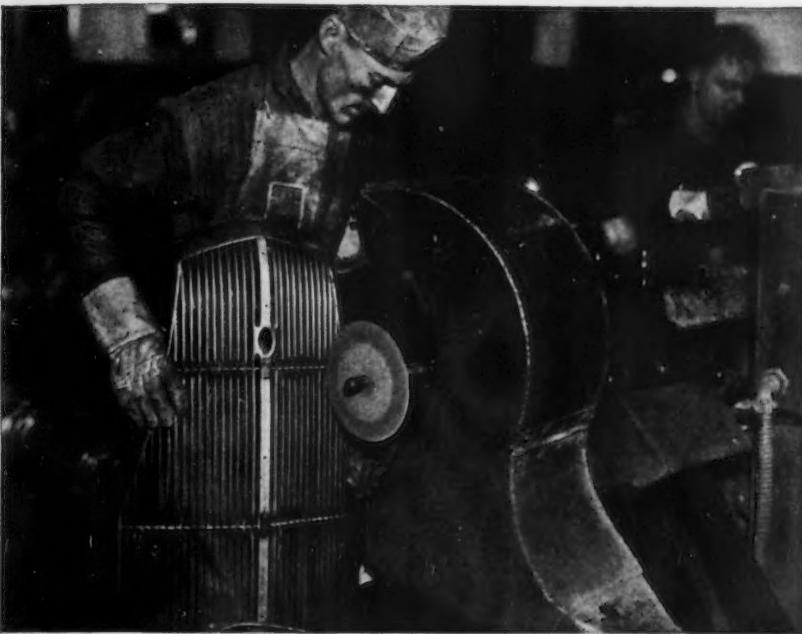
Bureau of Supplies and Accounts, Navy



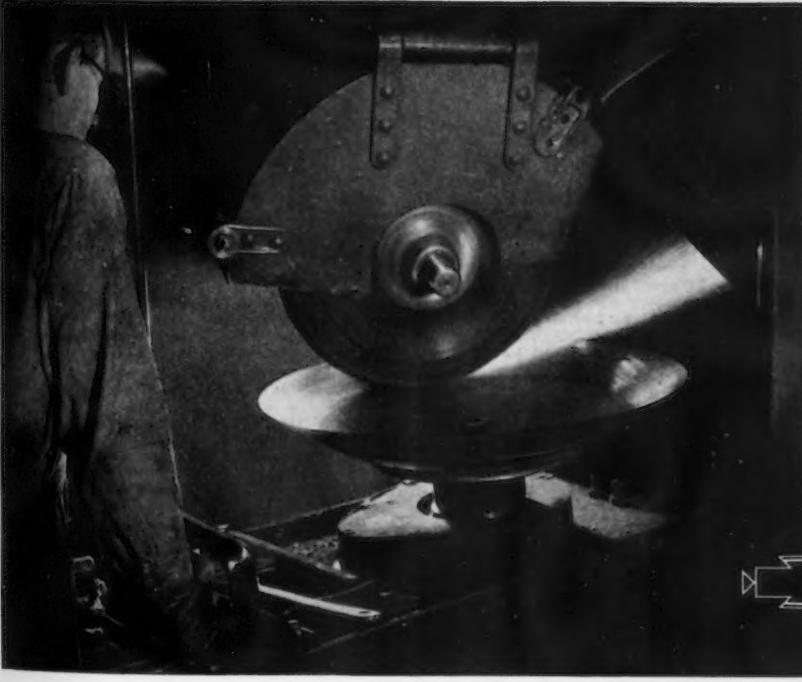
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Department, Washington, asks bids until Feb. 16 for 30 lathe chucks (Schedule 9938), 22,550 steel rollers, 59,764 lb. steel forgings, and 144 steel roller paths (Schedule 9878) for Washington yard; machine screws and nuts, and wood screws (Schedule 9896); until Feb. 19, parts for airplanes (Schedule 900-485), starters for aircraft engines (Schedule 900-479), parts for bomb racks for airplanes (Schedule 900-482), one motor-driven, single cylinder, cabinet type, ball bearing surfer (Schedule 9932), 11,000 ft. lighting and power cable (Schedule 9925), mechanical revolution counters (Schedule 9966) for Eastern and Western Navy yards; six aircraft propeller blades (Schedule 9970) for Lake-

hurst, N. J., Naval Station; one drill cutter and reamer grinder (Schedule 9921) for Keyport yard; two diesel engine-generator sets (Schedule 9957) for Norfolk, Va., yard; one instantaneous, continuous, indicating type propeller shaft revolution system (Schedule 9922) for Bellevue, D. C., yard.

SOUTH CENTRAL ▶

Board of Aldermen, Oxford, Miss., asks bids until Feb. 15 for one 750-hp. diesel engine-generating unit with accessories for municipal power station. W. T. Chandler is city clerk.

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Hardwick Stove Co., Cleveland, Tenn., has let general contract to Grover Lee, Cleveland, for three-story addition, 66 x 180 ft. Cost over \$65,000 with equipment.

United States Engineer Office, Vicksburg, Miss., asks bids until Feb. 15 for steel boiler tubes (Circular 172).

Lloyd A. Fry Roofing Co., 5302 West Sixty-sixth Street, Chicago, has let general contract to Thomas & Belz Co., Memphis, Tenn., for one-story branch plant at North Memphis, 120 x 500 ft., where site recently was acquired. Cost about \$160,000 with equipment.

Marshall Stove Works, Lewisburg, Tenn., has let general contract to C. S. Sanders, Lewisburg, for rebuilding part of plant recently destroyed by fire. Cost close to \$100,000 with equipment.

Barr Bottling Co., Jackson, Miss., care of M. Robertshaw, Greenville, Miss., president, recently organized by Mr. Robertshaw and associates, has acquired building on Terry Road, Jackson, and will improve for mechanical-bottling works. Cost over \$40,000 with equipment.

City Council, Jackson, Tenn., has called special election March 18 to approve bond issue of \$364,000 for electrical distributing system, including transmission line for connection with TVA high-tension lines for source of supply.

◀ SOUTHWEST ▶

United States Engineer Office, Manufacturers' Exchange Building, Kansas City, Mo., asks bids until Feb. 16 for one gasoline engine-driven hoist (Circular 423).

George W. Deegan, 5510 North Sheridan Road, Chicago, is at head of project to erect brewery on former site of Jackson County Court House, Kansas City, Mo., where property is being acquired. Plant will include main four-story brew-house and mechanical-bottling works, about 100 x 155 ft., and multi-story storage and distributing building. Certain structures on site will be remodeled for different plant divisions. Entire project will cost close to \$500,000 with machinery. A company will be organized to carry out development.

Common Council, Garnett, Kan., will ask bids soon for extensions and improvements in municipal electric power plant, including installation of new 1000-hp. diesel engine-generator unit and auxiliary equipment. Paulette & Wilson, National Reserve Building, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Southland Paper Mills, Inc., Dallas, Tex., care of Wirt Davis, chairman of board, Republic National Bank, Republic Bank Building, Dallas, recently organized by Mr. Davis and associates, is securing property in east Texas for new pulp and paper mill to specialize in production of newsprint, using Texas pine for pulp wood. Plant will include machine shop, power house, pumping station and other mechanical divisions. Cost close to \$5,000,000 with machinery. Arthur Temple, president, Temple Lumber Co., Texarkana, Tex., and E. L. Jurth, president, Angelina County Lumber Co., Lufkin, Tex., are interested in project.

A. J. Bayer Co., 1112 Wood Street, Houston, Tex., manufacturer of ornamental iron, brass and other metal products, has acquired three-acre tract at Telephone Road and Jardine Street for plant. Plans are under way for initial one-story unit, 80 x 200 ft. Cost over \$75,000 with equipment. Main offices of company are at 2300 East Slauson Avenue, Los Angeles.

◀ OHIO AND INDIANA ▶

United States Engineer Office, Zanesville, Ohio, asks bids until March 4 for steel towers, guy anchors, etc., for relocation of Beach City-Cambridge cable line of Ohio Telephone & Telegraph Co., near Beach City, Ohio.

General Rivet Co., Cleveland, Ohio, recently organized by Clark McConnell and associates, has leased 15,000 sq. ft. floor space in building at 1313 West Eightieth Street, for plant for production of complete line of hollow steel, brass and bronze rivets. Mr. McConnell will be president of new company, and W. H. Schwab, vice-president and general manager.

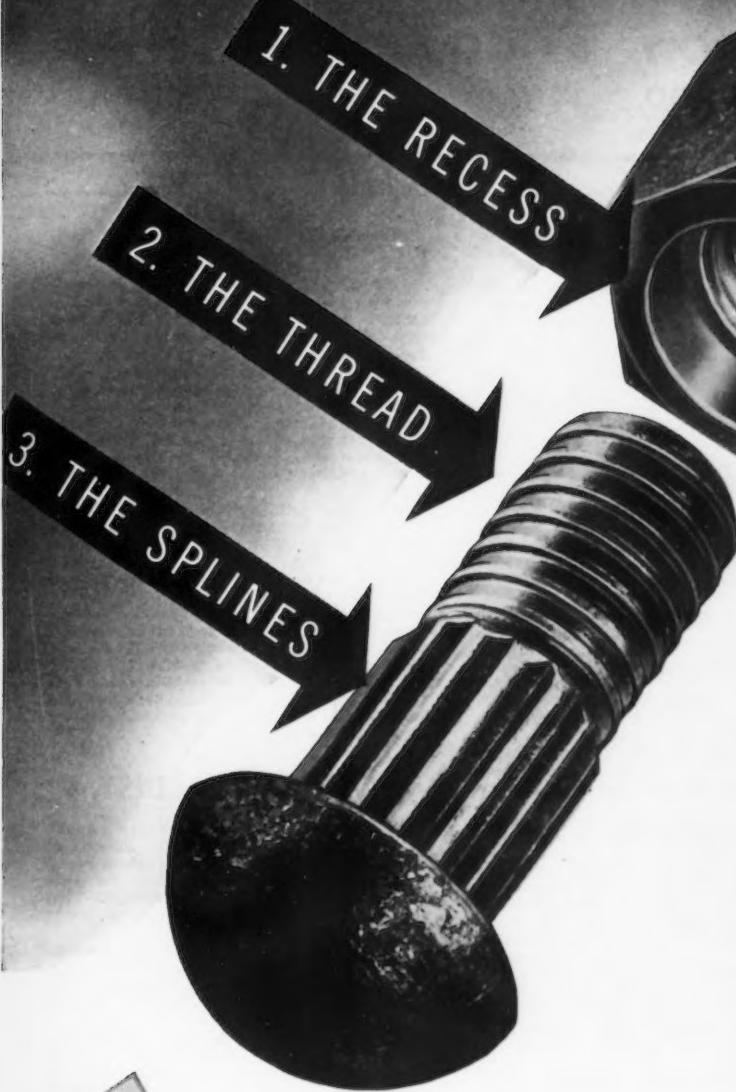
City Council, Nelsonville, Ohio, asks bids until Feb. 15 for extensions and improvements in municipal electric power plant, including three new boiler units and ac-

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cessories, engine-generator, boiler feed pumps and auxiliary equipment. Cost about \$80,000. B. M. Coakley, Nelsonville, is architect; R. G. Ingelson, 299 South Front Street, Columbus, is consulting engineer.

Cleveland Crane & Engineering Co., Wickliffe, Ohio, has let general contract to Austin Co., Cleveland, for one-story addition, 70 x 350 ft. Cost close to \$250,000 with equipment.

W. Harold Anderson, Toledo, formerly president of National Milling Co., 2221 Front Street, recently resigned, has organized a company to erect a 1,000,000-bu. grain elevator on local site. MacDonald Engineering Co., 1 North LaSalle Street, Chicago, will be in charge of construction. Cost over \$400,000 with elevating, conveying, screening and other equipment.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 15 for four electric hoists (Circular 492), rate of climb indicators (Circular 499); until Feb. 16, galvanized steel wire (Circular 498); until Feb. 17, bomb rack solenoid assemblies (Circular 496).

Kauneel Coach Corp., St. Johns, Mich., recently organized to take over Kauneel Coach Co., with local plant for production of streamlined house and trailer coaches and parts, is arranging for purchase of plant near Indianapolis, for new branch works. Temporary offices have been established at 814 Guaranty Building, Indianapolis, care of Arthur H. Wyatt, investment banker, who is interested in project. Later it is planned to establish another plant on Pacific Coast. Alwin A. Gloczner, formerly president and general manager of Covert Gear & Mfg. Co., Lockport, N. Y., is president of new corporation; Frank S. Stratton is vice-president.

◀ MICHIGAN DISTRICT ▶

Firestone Tire & Rubber Co., Akron, Ohio, has acquired about 300 acres near Wyandotte, Mich., as site for new mill, with power house, machine shop and other mechanical departments. Cost over \$2,000,000 with machinery.

Bowen Products Corp., 2760 West Warren Street, Detroit, manufacturer of metal stampings, will begin superstructure soon on one-story plant at Ecorse, Mich., about 125,000 sq. ft. floor space, for which general contract recently was let to O. W. Burke Co., Fisher Building, Detroit. Company will remove present Detroit plant and branch works at Auburn, N. Y., to new location, where large increased capacity will be carried out and production concentrated. Cost over \$500,000 with equipment. Christian W. Brandt, Madison Theater Building, Detroit, is architect.

Rich Mfg. Corp., Jackson, Mich., manufacturer of gasoline engine pistons and kindred automotive products, has leased additional buildings for expansion, more than doubling present output. Installation will include electric steel furnaces and auxiliary equipment.

National Broach & Machine Co., 11455 Shoemaker Avenue, Detroit, has let general

contract to Bryant & Detwiler Co., Penobscot Building, for one-story addition. Cost close to \$30,000 with equipment.

Bay City Shovels, Inc., Bay City, Mich., manufacturer of steam shovels and parts, and kindred heavy equipment, has let general contract to Weber Construction Co. for one-story addition, 85 x 200 ft., for expansion in machine division. Installation will include machine tools, overhead traveling crane and other equipment. Cost over \$75,000 with machinery.

◀ MIDDLE WEST ▶

Keeley Brewing Co., 516 East Twenty-eighth Street, Chicago, has asked bids on general contract for one-story mechanical-bottling unit. Cost over \$40,000 with equipment. George Lehle, 111 West Washington Street, is engineer.

International Harvester Co., 606 South Michigan Avenue, Chicago, motor truck division, has plans for one-story branch plant at Winnipeg, Man., 200 x 200 ft., to be carried out by International Harvester Co. of Canada, Ltd., a subsidiary. Cost about \$150,000 with equipment.

Quartermaster, CCC, Fort Crook, Neb., asks bids until Feb. 15 for woodturning lathes, two circular saws, six bandsaws, 13 scroll saws and two jointers (Proposal 5701-71).

City Council, Holdredge, Neb., plans extensions and improvements in municipal electric power plant, including equipment. Cost about \$100,000. Bids will be asked soon. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

United States Engineer Office, St. Paul, Minn., asks bids until Feb. 15 for lock parts and castings for locks Nos. 2 to 9, inclusive, Mississippi River, including motor pinions, back gears, back shaft pinions, shear shaft gears, limit switch gears, pillow blocks, gate struts, sector arms, idler wheels, feather keys, springs, etc. (Circular 160).

Chicago Beverage Co., 3423 West Thirteenth Place, Chicago, has let general contract to J. Weinstein, 4957 West Washington Street, for two-story addition, 25 x 157 ft. Cost over \$50,000 with equipment. S. E. Berkenblit, 64 West Randolph Street, is architect.

Bureau of Reclamation, Custom House, Denver, asks bids until Feb. 15 for copper cable, copperweld ground rods, copperweld staples, bare copper cable, couplers, clamps, terminals and other equipment (Proposal B-23239-A), copper cable, copper wire, bus support fittings, bus clamps, copper pipe, terminals and other equipment (Proposal B-23240-A).

Chain Belt Co., Milwaukee, has placed general contract with Selzer-Ornst. Co., 6222 West State Street, for new machine shop unit, 92 x 152 ft., at West Milwaukee manufacturing unit, costing about \$200,000 with equipment.

Maysteel Products, Inc., Mayville, Wis., has been organized by L. P. McIntosh, formerly of Milwaukee, to take over plant and equipment of Wisconsin Radiator Furniture Co., Mayville, and enlarge line to include sheet metal products. Some additional press equipment remains to be purchased.

Malleable Iron Range Co., Beaver Dam, Wis., manufacturer of stoves and ranges, has placed general contract with Hutter Construction Co., 134 Western Avenue, Fond du Lac, Wis., for adding third story on main storage building, 75 x 120 ft., and remodeling main floor for addition to production facilities.

Oscar Mayer & Co., Chicago, meat packers, are considering bids taken Jan. 28 for construction of \$100,000 addition to main plant in Madison, Wis., at 910 Mayer Street. It will be 140 x 150 ft., two stories and basement, designed by H. P. Henschien, architect, 59 East Van Buren Street, Chicago.

Manitowoc Shipbuilding Corp., Manitowoc, Wis., has started work on machine shop addition, 55 x 100 ft., designed by Wisconsin Bridge & Iron Co., Milwaukee, to cost about \$50,000, including welding and other equipment.

Pick Mfg. Co., West Bend, Wis., manufacturer of hub caps and other replacement parts for automotive wholesale and jobbing trade, sustained loss of \$25,000 by fire which gutted new machine shop extension about to be completed and destroyed an adjoining warehouse. Reconstruction is planned at once.

◀ WESTERN PA. DIST. ▶

Bucyrus-Erie Co., 1202 West Twelfth Street, Erie, Pa., manufacturer of cranes, power shovels, draglines and kindred heavy machinery and parts, has plans for one-story addition, 56 x 160 ft. Cost over \$60,000 with equipment.

Sharon Tube Co., North Water Avenue, Sharon, Pa., manufacturer of steel tubing and kindred products, has filed plans for one-story addition, 56 x 160 ft. Cost over \$60,000 with equipment.

Duraloy Co., South Twenty-sixth Street, Pittsburgh, manufacturer of alloy steel castings, etc., plans rebuilding part of foundry and machine shop at New Cumberland, W. Va., recently destroyed by fire. Loss over \$60,000 with equipment.

Damascus Steel Casting Co., Block House Run, New Brighton, Pa., has let general contract to O. R. McNutt, Eleventh Street, for one-story addition, 45 x 60 ft., for extension in machine shop. Cost close to \$30,000 with equipment.

◀ PACIFIC COAST ▶

American Distillery, Inc., Sausalito, Cal., has let general contract to C. A. Immel, 24 Catalpa Avenue, Mill Valley, Cal., for one-story additions to distilling plant, and remodeling and improving present buildings. New equipment will be installed. Cost over \$100,000 with equipment. W. E. Murray, 908 Hayes Street, San Francisco, is engineer.

San Diego Consolidated Gas & Electric Co., 855 Sixth Street, San Diego, Cal., has plans for one-story addition to steam power plant at 707 West Broadway, 100 x 110 ft. Cost close to \$100,000 with equipment.